The Builder.

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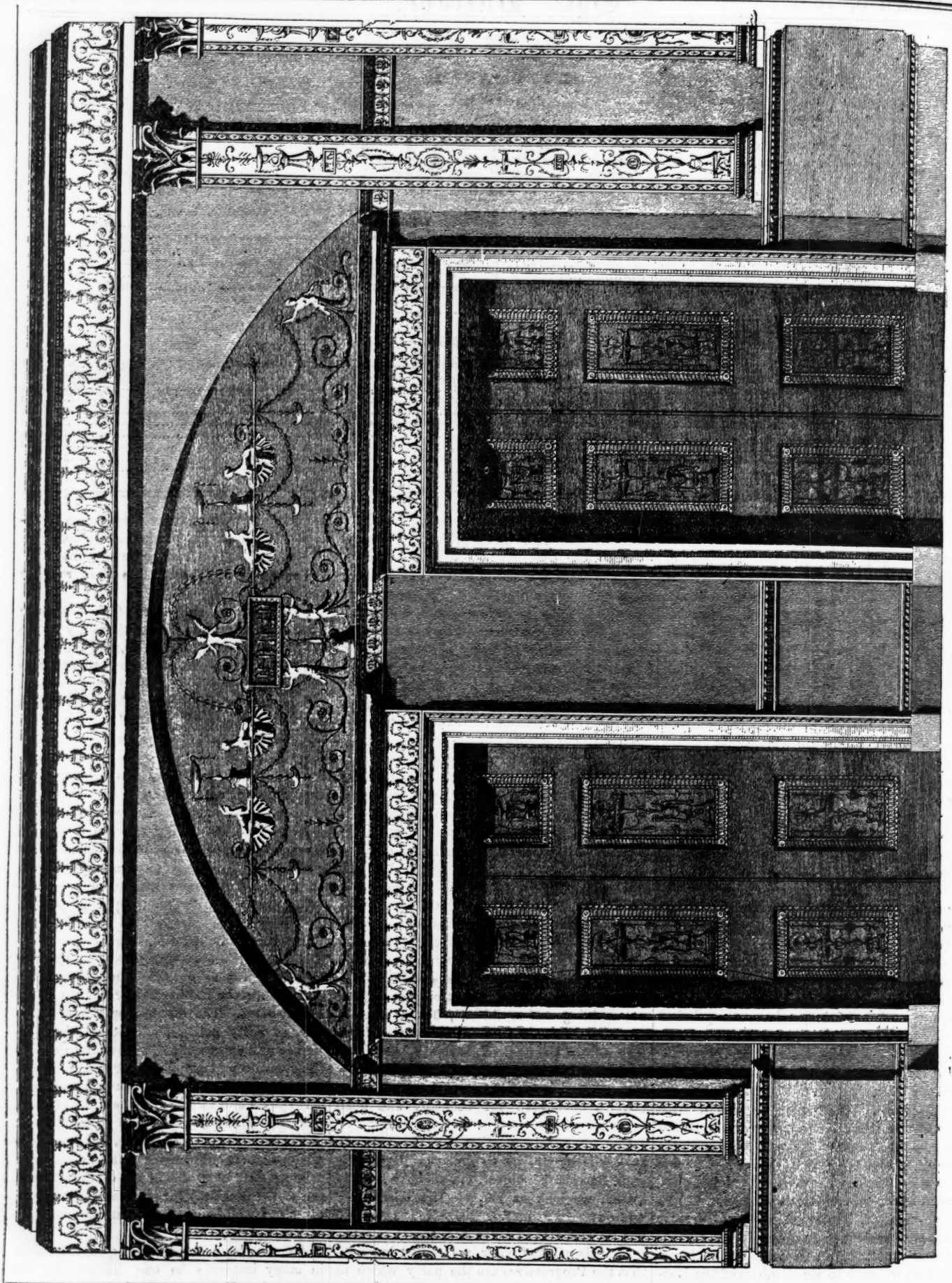
The London County Council Election.

AS this number of the *Builder* reaches the hands of its readers, most of those who have their business house or place of residence in London will, no doubt, be turning over in their mind the manner in which their vote shall be given at the County Council Election. We assume that no person who takes sufficient interest in municipal affairs, or in professional matters, as to be a reader of the *Builder*, will fail to vote at this election. The true way in which to assure the prosperity of the Metropolis, and to safeguard a prudent progress, is for each citizen to exercise his franchise. But it must be confessed that householders may well be in doubt what course to pursue at this election. Most men who look at things in a business-like and calm manner must regret that political influences have come so largely into this election, and that the political machinery of the Metropolis has been imported into the present struggle. It is difficult for men to realise the enormous material and social interests which the County Council has to serve. The work connected with a seat on this municipal council would tax the ability and the tact of the most capable of our men of business; and no one with a knowledge of current affairs will deny that in our large mercantile centres are to be found men of higher ability and greater practical capacity than any, except two or three, of our leading statesmen. It is such persons that we wish to see members of the London County Council,—men versed in business, well acquainted with practical work, accustomed to the management of large concerns; merchants, architects, engineers, and those who have served their country in important official places beyond the seas. The struggling journalist, the pushing barrister, the doctrinaire with a fad to air, inexperienced and without a capacity for business, these are the persons we do not wish to see on the County Council. We do not deny that a considerable amount of useful work has been done by the late Council, but we assert emphatically that a great deal of valuable time has been wasted by useless talk, and by mere academic discussion. We hope to see this remedied in the new Council, but it will not be cured unless the majority are composed of men of business, having a central object in view. This object is the good administration of London as it is. There is work enough and to spare, without entering on new ventures. Take for example the purchase and the working of tramways. This is a standing example of ill-considered zeal. The Council have enough to do with those matters under their control, yet they rush into new schemes when those matters over which they already have control are not satisfactorily managed. Again, take for example the resolution which was passed on April 11, 1889, that the Council should have control of the police. This was done by a body which had been barely three months in existence, which could not possibly appreciate the extent and difficulty of its existing work, and which had yet to obtain the confidence of its constituents. This act showed not only a spirit of overweening self-confidence, but a want of appreciation of the true administrative functions of the Council. It is this spirit which we desire to see banished from the new Council, and replaced by one of modest but anxious solicitude for economy and good administration.

The practical question for the voter to answer is how is he to do something by his vote towards this object. As we have already stated, we look at the election absolutely without party bias. Regarding the two parties, the Progressives and the Moderates, from this point of view, we cannot but note that the Progressives are the party which in principle asks for larger powers, and desires new principles of administration; while the Moderates desire to administer the affairs of London as they are and in an economical spirit. Therefore, without going into personal questions, a Moderate candidate is primarily more worthy of support than a Progressive candidate. In certain instances, however, the Progressive candidate may be a man of greater business capacity than his Moderate opponent. Under such circumstances it may be desirable to support a Progressive candidate. But such a step should be taken with caution, and only when the personal capacity and character of the candidate are thoroughly known.

On the other hand, some of the Moderate candidates seem to be possessed mainly by the spirit of opposition, and to be ready to frame their programme not according to any consideration of what should be the proper scope and powers of the future County Council, but on the mere principle of opposing anything and everything that is suggested by the "Progressives." Such a candidate, for instance, will announce his intention to oppose the placing of the Water Supply of London in the hands of the Council (obviously the most fitting body to deal with the supply of a necessary of life which ought not to be made a vehicle for money-making), on no other apparent ground but because taking over the water supply is part of the Progressive platform. This kind of thing is simply puerile, and only shows that the Moderates themselves, or some of them, are just as guilty of importing party politics into the County Council as any of the Progressives. The essence, or the essential evil, of party politics, consists in the pursuance of a course of action merely to thwart the opposite party, and not because it appears in itself the best course for the general good. The spread and increase of this spirit of mere party opposition is one of the great curses of public life in the present day, and it can nowhere be more out of place than in a body the primary duty of which is the carrying out of the works necessary for the material management and well-being of such an immense city as London.

As we have said, the question must in many instances be one difficult for the voter who wishes to do his best for the Metropolis to decide. In some instances in America independent citizens have combined to place men on municipal councils who are free from political influences and belong to no party. If the result of the present election is unsatisfactory, there can be no question that before another election comes round some such movement must be begun in London. For the moment, however, the duty of every voter appears to be to vote for practical



End Wall of a Drawing-room. From "Works in Architecture, by Robert and James Adam."

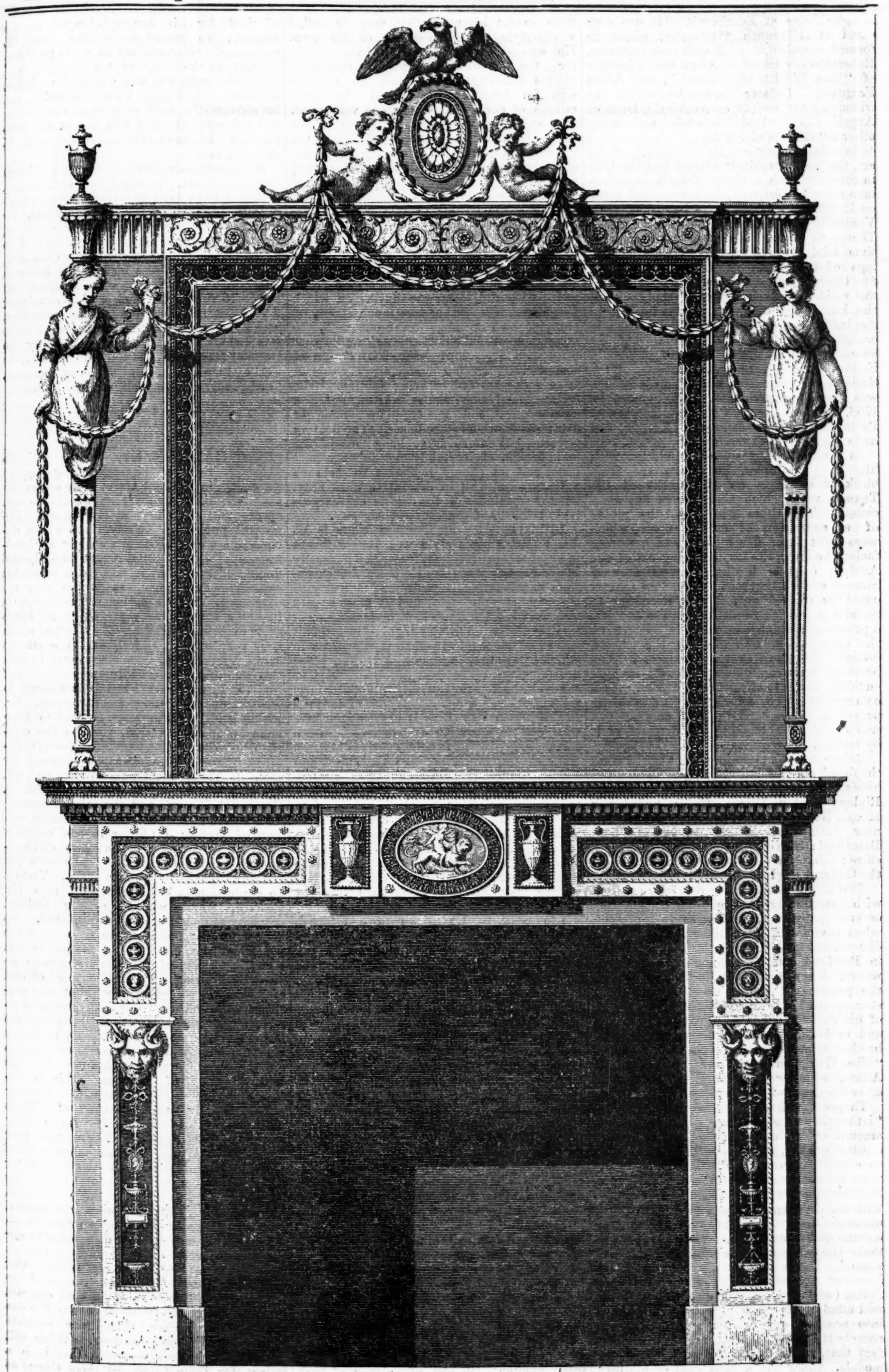
men, and also to bear in mind that the Progressive party have had the upper hand on the late Council, and that the spirit of their programme is theoretical rather than practical.

WILLESDEN.—A new cottage hospital is about to be built from the designs of Messrs. Newman & Newman, architects. The accommodation to be at first provided is for nine beds, with the necessary offices; but the plans provide for the future extension of the building to accommodate eight male and eight female patients, with a separation ward.

ROBERT ADAM.

THE 3rd of March will have recalled to memory the name of a man well known in the history of architecture, and, indeed, of art generally, for on that day exactly a hundred years ago died Robert Adam, whose inventive genius wrought a considerable change in the architectural style of his day, and whose taste and compositions,—although the one has been denounced as "vicious" and the other as "depraved,"—have established his fame as an independent artist and a man who has left his mark on the architectural history of this country.

Robert Adam was born in 1728 at Kirkcaldy, in Fifeshire (the birthplace also of Adam Smith), and was the second and, we may add, the most noted of four brothers, sons of William Adam of Maryburgh, himself an architect of some distinction, having designed Hopetoun House and the Royal Infirmary at Edinburgh, and holding also the appointment of



Design for Chimney-piece. From "Works in Architecture, by Robert and James Adam."

King's Mason at Edinburgh. He was educated at Edinburgh University, where he formed friendships with such men as Hume, Robertson the historian, Adam Smith (author of "The Wealth of Nations"), and Adam Fergusson. In later life, too, he enjoyed the friendship and society of Archibald, Duke of Argyll, the Earl of Mansfield, and many other notabilities of his day.

In order to improve his knowledge of his art, the young architect visited Italy in 1754 in company with a clever French draughtsman named Clérisseau, and remained there until 1757, in which year he sailed from Venice to Spalatro (as it was then called). There he was busily engaged for some time studying and making careful drawings of the ruins of Diocletian's palace for the purpose of obtaining some idea of the residential architecture of the ancients, the knowledge of Classical architecture in England being at that time almost entirely confined to public buildings. During his absence from England he was elected a Fellow of the Royal Society, and also of the Society of Antiquaries, and, after his return, was appointed architect to the King. In 1768, however, he was elected Member of Parliament for the county of Kinross, and had consequently to resign that position.

In the following year, in conjunction with his brother James, he began the large block of buildings on the banks of the Thames with which their names are associated. The shore was raised by means of a succession of arches, upon which were built three fine streets, and a terrace facing the river, the locality being called the Adelphi (ἀδελφοι, brothers), in memory of himself and his brothers. Before the scheme could be carried out, it was necessary to reclaim a portion of land from the Thames, a proceeding which was strongly opposed by the Corporation, who claimed the ground beneath the river as their property. The brothers, however, obtained a Bill in 1771 enabling them to effect their purpose. As a commercial speculation, this undertaking proved a failure, and in 1774 another Bill was obtained, sanctioning the disposal of it by lottery.

Robert Adam's more important works were the *façade* of the Admiralty, which was built to hide the inelegant portico designed by Thomas Ripley; Luton House, Beds; Lansdowne House, Berkeley-square; Caen Wood House, near Hampstead; Osterley House, near Brentford; Sion House; Keddleston, Derbyshire; Compton Verney, Warwickshire; and the General Register House, Edinburgh.

The brothers Adam are generally credited with introducing the method of building several houses together, so as to represent, when completed, one building of imposing dimensions, instances of which may be seen in Portland and Hamilton Places, and elsewhere. They appear, also, to have introduced the practice of facing brick houses with stucco. In 1764 Robert published the results of his visit to Diocletian's Palace at Spalato, and in 1773, with the co-operation of his brother James, commenced the publication of "The Works in Architecture of R. and J. Adam," which was not completed until 1822, after the death of both authors.

The great merit of the Adams, says Fergusson, "is that they stamped their works with a certain amount of originality, which, had it been of a better quality, might have done something to emancipate art from its trammels. The principal characteristic of their style was the introduction of very large windows, generally without dressings. These they frequently attempted to group three or more together, by a great glazed arch over them, so as to try and make the whole side of a house look like one room." Fergusson's rather bald criticism, however scarcely does justice to Robert Adam (whom we may take to have been the real mind of the "firm"), as he omits to take into account one of his greatest merits, namely that of refinement of detail, and the fact that, while, basing his work on Classic models, Adam put a good deal of his own spirit and treatment into the details, and to some extent invented what may be called a sub-style of Renaissance of his own. He was especially good in his design for the internal decorative treatment of his buildings, and much of his design for furniture detail and the decorations of doors and windows is very good. His style in this kind of work is no doubt open to the charge of being too "pretty" and sometimes verging on flimsiness; but in spite of these defects his work was never vulgar. We give reproductions of two designs showing his treatment of this class of work. The first of these, the section of one end of the "second drawing-room" in the Earl of Derby's house in Grosvenor-square (as given in his "Works in Architecture") is a typical example of his manner of treating the side of a room, and partly illustrates the device on which Fergusson lays rather too much stress, of grouping two openings under one arch, the tympanum over the doors being in this case filled with a graceful ornamental design of somewhat Pompeiian character, only that it is in relief instead of being painted. The other illustration shows a design for a chimneypiece and looking-glass frame or overmantel in the same house. The floating wreaths, cut out so as to hang free of the main design, are certainly not in very pure taste, and we should not wish to see such a feature imitated in decorative work now; but the remainder of the details are exceedingly refined and graceful in their way.

In his exterior architecture there is no doubt that Adam's style was very deficient in architectural incident, force, and generally in picturesqueness (though there are exceptions in this latter respect), but it had also the merit of refinement, and it must be said also that his buildings look better in execution than they do in the highly-finished but tame and mechanically-shaded elevations in which he illustrated them. Yet even these drawings are of interest in their way, as showing how completely the architectural taste of one age is opposed to that of another. In the present day there is always an endeavour, even in elevation drawing, to secure a certain degree of picturesque surface texture. Yet a century and a half ago the ablest and most successful English architect of his day lavished the greatest care in engraving and the most sumptuous pages, both in regard to size and quality of paper, on drawings from which all that we call picturesque was carefully excluded. It is useful to bear this in mind, and to consider whether possibly our present picturesque method of drawing architecture may not seem as much beside the mark to our descendants a century hence.

The book to which we have referred, "Works in Architecture of Robert and James Adam, Esquires" (not "architects," please to note) is in itself a remarkable relic of architectural illustration of a former day. It is in two mighty folios, printed on thick paper, and the text in broad parallel columns of English and French. The fact that it was thought necessary to have this dual language is an indirect testimony to the fact, which we know otherwise, that Adam's reputation was not only English but European. There is an anecdote we remember to have read (but cannot give the source of it) of Robert Adam's reply to the agent of some nobleman who was very much offended because the architect would not waste time in waiting two or three days to have an interview with him about a building: "Does he expect that I, who have been presented to nearly all the crowned heads in Europe, am to lose my time waiting on his pleasure?"

Robert Adam continued to display his vigorous talent almost up to the day he died, for in the year preceding his death he designed no less than eight public buildings and twenty-five private houses. His talent, however, was not confined to the limits of his own profession, for he gained no little distinction as a designer of ornamental furniture, and also as a landscape painter. He was also a man of high social qualities, a good singer and evidently admired for his accomplishment in this respect; we quoted some time since the enthusiastic reference to him made by Fanny Burney in the diary of her younger days, where she (who was well qualified to judge) mentions his singing with admiration, and his conversation with even more enthusiasm, and evidently thought him one of the most pleasant companions for an evening that she had ever met.

It is a curious circumstance that two different branches of art,—painting and architecture,—should have been deprived almost simultaneously of their respective leaders, for only a week previously to the death of Adam, Sir Joshua Reynolds was carried to his last resting-place in St. Paul's Cathedral. The eminent architect died at his house in Albemarle-street, and was interred on March 10 in the south aisle of Westminster Abbey,—a sufficient proof of the estimation, both socially and professionally, in which he was held. The pall was supported by the Duke of Buccleuch, the Earl of Coventry, the Earl of Lauderdale, Lord Viscount Stormont, Lord Frederick Campbell, and Mr. Pulteney.

NOTES.

WHATEVER may be the ultimate result of the forthcoming stoppage in the coal trade, there seems but little doubt that merchants and agents will fare best at the outset. The general public,—especially those whose circumstances compel them to adopt a "hand-to-mouth" system with regard to coal,—are finding already that it will be a somewhat expensive experiment, as far as they are concerned. For the action of the miners in forcing a stoppage is regarded on all hands as an experiment, and one the effect of which it is very difficult to forecast. The officials of the Miners' Federation are careful to state that they have no wish to raise the price of coal to the consumers; but it is difficult to see what else they could expect. Mr. Pickard, M.P., who may be said to have built up the Federation, justifies the stoppage in the following terms:—"(1) Because there is no lessened demand for coal. 2. The general public do not and will not gain any benefit if coal is lowered. 3. Because the lowering of the price of contract coal will do three things: (*a*) Lessen coal owners' profits; (*b*) lower miners' wages if allowed; (*c*) transfer or put into dividend-hunters' pockets the money coal owners and miners should have put into theirs. There is no depression in the coal trade," says Mr. Pickard, "and we are setting political economy at defiance, as we did in 1888. We were condemned then, as we are now, and as we expect to be condemned." It will be seen that the position of manufacturers (who are urgently pressing for relief in price of coal and coke) is passed over without any consideration, and yet our manufacturers,—especially in the iron and steel trades,—are losing much of their old supremacy in foreign markets, mainly as a natural consequence of the higher wages obtained by this boasted policy of defiance. This is exemplified by the statistics recently published by the Board of Trade with respect to contracts for railway material for Egypt. Before the year 1889, we are told, English manufacturers almost invariably secured the orders for rolling-stock, &c., no Continental firms being able to quote so cheaply. Since that year, however,—*i.e.*, following upon the general rise in wages so triumphantly referred to,—we have gradually had to give place to our foreign competitors, who have been enabled to offer prices we could not touch. Our quotations appear to have continued to advance, and last year, in an open contract for truck work, the lowest British tender was considerably higher than four separate Belgian and French quotations. When will the labour leaders recognise that it is a fallacy for them to regard these things as being no concern of theirs?

MR. A. S. MURRAY, in an interesting letter on the subject of the mausoleum controversy, offers us some figures in controversion of our opinion (page 154 *ante*) that Professor Gardner was in the right in judging that the statues of the mausoleum room at the British Museum are out of scale with the horses. "Science is measurement" (as Mr. Marks suggested in one of his cleverest pictures), and Mr. Murray's figures are important as far as they go. He compares the measurements of the heads of man and horse. He finds that the head of Mausolus in the statue is 15 in. in length, and that of the mausoleum horse 41 in., a proportion of 1 to $2\frac{4}{6}\frac{4}{0}$. The head of the Theseus in the Parthenon pediment is 12 in. high, that of the horse of Helios 31½ in., giving a proportion of 1 to $2\frac{4}{6}\frac{5}{0}$. He has measured an ordinary man's head and an ordinary horse's head, and finds them respectively 9 in. and 24 in., giving a proportion of 1 to $2\frac{4}{6}\frac{0}{0}$. This is pretty close certainly, as far as details are concerned; but there is no doubt the horse as a whole is larger in comparison with the figures than the Greeks generally represented them in sculpture (their horse being perhaps a small breed); and there is a general appearance about the mausoleum horses of breadth and simplicity of style, as if intended for a position far from the eye, while the figures are much more minute in detail. If they were in the chariot, they must have looked mere dolls at the height at which they were put. The scale is only one-fourth larger than that of the Parthenon pediment figures, and the height (if they were in the chariot) nearly three times as great. We do not (and did not) regard Professor Gardner's position as proved, but those statues do not look like works to be placed at such a height, or as running parallel with the horses in regard to mode of execution for the position. If they were placed in the quadriga, they must have entirely failed in their effect as portrait statues, and have looked rather awkwardly placed, standing up in a chariot with no action connecting them with the horses. They appear to us as figures which would have have had a closer decorative connexion with the architectural design of the structure.

IF we are correctly informed by an auditor, Miss Sellers, in the first of a course of evening lectures at the British Museum, delivered on Tuesday last, in dealing with the architecture of the Parthenon, told her audience that the architectural design of the Parthenon resided in the *cella*, not in the external order, and that in place of the triglyphs representing the ends of beams and the metopes the spaces between them, the real explanation was that the triglyphs represented spaces to put the ends of the beams in, and the metopes the wall between. In regard to the latter statement the lecturer cited Vitruvius, who however does not precisely say that, but that the triglyphs were an ornamental covering over the ends of the beams. Anyone however who is acquainted with the forms of the quasi-timber rock-cut designs of Asia Minor (of which Vitruvius knew nothing) can have no doubt whatever as to what the triglyphs really represented; and it was exactly because they represented solid constructive portions that the Greek architects shifted the last triglyph to the angle of the building, instead of leaving it over the centre of the column as the Romans did; the Roman method aptly representing, no doubt, the false theory of Vitruvius. And in regard to the metopes, is Miss Sellers aware that in the Parthenon itself the metope slabs are thin facing-blocks which could carry no weight, and which are entirely separated from the wall structure? And that Mr. Tadema has found representations (we think at Pompeii) of metope slabs represented as turning on a pivot, an arrangement which he reproduced in one of his pictures? In regard to the main architecture of the building, no doubt the *cella* is the constructive *raison d'être* of the temple, but nearly all which makes the exterior architecture of the Parthenon expressive in detail resides in the column and entablature. We have no wish to say unkind things, but this kind of architectural criticism, addressed to those who come to sit at the feet of a lecturer and learn wisdom, cannot be allowed to pass without comment. Such teaching confirms us in a belief we have long held, that woman is generically incapable of understanding construction and constructional expression in architecture, just as she is generically incapable of drawing buildings upright (a weakness which she shares, no doubt, with some painters of the other sex). It is amusing also to notice the emphasis laid on Vitruvius when he can be cited to support an eccentric theory of architecture, compared with the indifference with which he is dismissed with costs when (as in the matter of the Greek theatre) his statements do not fit in with the theories of Dr. Dörpfeld, the idol of the Hellenic lady students of the day.

IN Berlin, one may say throughout Prussia, a proposed reform in all matters relating to the education of the lower classes is causing intense excitement. The Prussian Government wishes to pass a piece of legislation which will cause an entire change in the administration, the curriculum, &c., of the Board Schools (a change which must have a most marked effect on the coming generation of the labouring classes) and their new Bill has been placed before the Diet. It is well to note that in framing their long list of proposals (worded in about two hundred paragraphs) the question of the housing of the school children during the hours of their education has had attention. Whilst, according to section 21 of the proposals, the civil governors of the provinces will have the right of making special general regulations for the erection of school buildings in their districts, the Government in section 22 distinctly wishes to see the following points taken into consideration throughout the country:—1. Every school is to have its own school-building, no part of which is to be used for any purpose liable to injure educational interests. 2. Every school class is to have a class-room for its own sole use. 3. In the selection of the site for a school-building sanitary requirements are to be taken into account, and in the planning of the building the amount of air and light to be given to each pupil, the mode of heating and ventilating to be adopted, the source of and the manner of distributing drinking-water, and the arrangement of the lavatories, are to have careful attention. 4. In each school-house there are to be residential quarters for at least one teacher. According to sec. 24, it will also be compulsory throughout the country to have an open space, "on which gymnastics can be exercised," and "on which the children can inhale fresh air during the pauses between each class hours," attached to, or in close proximity to, each school-building.

THE poor accommodation provided for third-class passengers on certain southern lines, to which we incidentally alluded a week or two ago, was last week the subject of an action at the Westminster County-court. The London Chatham and Dover Company sued a Mr. Addison for the difference between second and third-class fares between London and Birchington. The defendant admitted that on more than one occasion he had travelled in a second-class carriage with a third-class ticket, but stated that it was in consequence of the third-class carriages being so bad, and that he defended the action on public grounds. The Judge gave his verdict for the plaintiffs, but refused to allow costs, a decision which was received with loud applause,—renewed outside the court in the shape of approving newspaper comments. Now at the risk of being accused of condoning the short-comings of railway companies, we must say that this creates a very awkward precedent. A decision of this kind, when it does not carry costs, is really punitive as regards the plaintiff; and the Judge, in refusing the application for costs with indignation, evidently intended it as a punishment. Singularly enough the President of the Board of Trade was interrogated in the House of Commons the following day, as to how railway companies could be prevented from allowing passengers holding third-class tickets to travel in carriages of a higher class. Sir Michael Hicks Beach could only reply that the evil complained of would be extremely difficult to prevent. Hitherto, the first and second-class carriages have been invaded by third-class passengers mainly in consequence of insufficient accommodation. After Judge Scott's decision, however, railway companies may plead that passengers appear to be encouraged in this proceeding whenever they choose to regard the accommodation provided as being unsatisfactory. Certainly they are not allowed to escape paying the difference in the fare in the event of being discovered, but they have only to force the companies to put the matter into Court to make the latter lose more than the amount of the fare in recovering it. It may be urged that the need for improvement is so great that this discovery of a practical way of bringing pressure to bear upon the delinquents is a public gain. But where is the line to be drawn? Who is to decide whether the accommodation provided is or is not worth a penny a mile? It is, after all, only a matter of comparison. The carriages complained of would perhaps have been regarded as almost luxurious on one of the early Parliamentary trains, although, compared with the general run of modern rolling-stock, they are wretchedly uncomfortable.

THE passing of the second reading of the Bill for constructing a tramway line across Westminster Bridge must not be taken as assuring its ultimate success, for, in Committee, the Bill may be so altered as to make it useless for it to be carried out. It is clear, however, that the House of Commons was right in sanctioning the principle of the Bill. There is ample room for a tramway line on the Embankment, and it will interfere with no "amenities." Whether, however, there is any real public demand sufficient to make this extension a financial success is doubtful. There are no places of business along the route, and the District Railway, with low fares, is in competition. We should therefore be in no way surprised if the project is never realised.

TO the catalogue of the Electrical Exhibition at the Crystal Palace, now no longer "under revision," has been added a guide to the exhibits in the form of "a personally-conducted tour by the Editor." We are glad to see that "watts per hour," to which we lately called attention, has been removed from the last edition. Had we hoped for this result we would have quoted the errors more nearly in bulk, instead of giving a sample only. Since a fourth edition cannot be expected, it is now too late, and we will only give one further instance:—"A joule is the heat generated by a current of one ampère flowing with the force of one volt through a resistance of one ohm. In other words, one watt per second will produce an amount of electrical heat called a joule." Here we have two definitions, the second only of which is approximately right—we say approximately, because the joule is also a measure of energy in forms other than heat; the first is not merely incorrect through admitting the time factor, but is also redundant. Will Mr. Dowsing tell us how a current of one ampère can flow through a resistance of one ohm, under any other pressure than that of one volt?

THE interest taken in electricity and physical science, stimulated doubtless by the Exhibition now being held at Sydenham, is naturally reflected in current literature. No less than three leading London periodicals contain articles on these subjects in their March issue. First in importance and interest

is Lord Kelvin's contribution to the *Fortnightly Review* on the "Dissipation of Energy," a subject which he made his own, or, rather, which he originated just forty years ago, when he was plain Mr. Thomson. The *Nineteenth Century* has an article by J. E. H. Gordon, on the "Latest Electrical Discovery," and the *Contemporary Review* one by Mrs. Faithfull, on the "Electrical Cure for Cancer." We content ourselves for the present with simply noting the simultaneous appearance of these three articles, and reserve comment till next week.

THE February number of the *Journal of the Franklin Institute* contains the first instalment of Mr. Wm. S. Aldrich's papers on Electro-magnetic Machinery. Mr. Aldrich has evidently been struck by the beauty and simplicity of M. Reuleaux's analysis and classification of mechanisms in his classical work on the "Kinematics of Machinery"; and in these papers he aims at extending these modes of classification to dynamos, motors, &c., which could not be included in the original work, because they were not then invented. He is met at the outset by the difficulty of finding anything analogous to a kinematic chain in the transmission along a cable, but he boldly cuts the knot by assuming (provisionally) Dr. Oliver Lodge's somewhat fanciful scheme of the "gear-wheel" construction of the ether. This once granted, the writer shows by considering several practical applications of the motor-generators, or combinations of motors and generators, what electro-magnetic equivalents can be devised for belts, spur-gearing, and like means of transfer of rotation from one shaft to another, whether parallel or inclined at an angle. He then gives some ideal examples of what he calls the Electro-Kinematic Chain, which it is hopeless to attempt to make clear without the aid of a figure. The intention seems to be, by clamping the axis of a motor armature to cause the field to rotate and to carry with it the dynamo which supplies current to the motor, and which is rigidly connected with the rotary field of the latter. Returning from the imaginary to the real, the writer describes two electric drills, calling special attention to the "mechanical equivalents" of the electro-magnetic mechanisms. He promises in a later paper to give a "diagram of the electro-magnetic mechanism of the Van Depoele machine," which is the latter of the two drilling machines described.

SOME old London house-signs have been recently added to the Guildhall Museum. They consist of an ostrich, carved in stone; the two leather bottles purchased on the demolition, — for rebuilding, — of "The Leather Bottle" public-house at the corner of Leather-lane and Charles-street, Hatton-garden; a stone carving (one head restored) of a two-headed spread eagle, with date 1669, and initials E. (or L.) R. M., presented by Mr. M. Pope, F.S.A. Whence this sign came is not known; the spread eagle formed a common device. The famed "Spread Eagle" tavern in Gracechurch-street, whose predecessor is cited by Taylor, the Water Poet, in his "Carrier's Cosmographie," 1637, was pulled down in October, 1865. A fine specimen, and well preserved, is that of the "Cock and Bottle," in blue and white tiles. It belonged to a tavern on the southern side of Cannon-street, which was removed for an improvement of the thoroughfare in 1853-4. This sign was set up there about thirty years after the Great Fire. The house has been rebuilt, being now Nos. 94-6, and known by the same sign. A collection has been deposited in the Museum to illustrate the various shapes of the seventeenth century tobacco-pipes, whose discovery we announced in our issue of 6th ultimo. They were found in a bricked-in space beneath a vaulted cellar, on a spot that was latterly a garden, but where, according to Ogilby's survey of 1677, had stood a building of some kind. In clearing the ground two old walls, 62 ft. apart, reaching southwards from against Staple-inn towards Took's-court, have been laid bare to a considerable depth. A few of the pipes bear, on the heel, the name of a maker,—"JOHN HUNT." The Tobacco-pipe Makers' Company, ranking seventy-eighth in precedence out of eighty-nine, were first incorporated in 17 James I.; they obtained fresh charters in 10 Charles I. and 15 Charles II., with jurisdiction throughout England and Wales. References to them and to losses sustained by the grant of monopolies to certain persons, will be found in the Calendars of State Papers (domestic) for the period 1641-1667. A report (1834) of the Commissioners appointed to inquire into municipal and trade corporations shows that at that time the Company comprised 316 members, all engaged in the trade, with an income of about 100*l.* yearly, derived for the most part from quarterage paid by non-freemen. A petition by pipe-makers, of London and Westminster, made to Parliament in December, 1643, against the duty on their wares avers that "nearly 1,000 poor persons" lived by that industry.

IT seems likely that the projected preservation of Hilly Fields, Lewisham, as an open space, will be accomplished. The purchase-money for the 41 acres is stated to be 42,000*l.* Towards this the London County Council agreed, last week, to contribute, conditionally, not more than 22,000*l.*; the Greenwich District Board have promised 7,000*l.*; and other subscriptions amount to about 8,000*l.* The fee of 17¾ acres out of the area belongs to the Bridge House Estates; in respect of that portion, the Court of Common Council have decided to offer no opposition in the event of an application being made to Parliament for a Bill to enable the Corporation to sell the same. The Kyrle and the Commons Preservation Societies are co-operating with the Metropolitan Public Gardens Association to secure the ends in view.

AT Messrs. Dowdeswell's Galleries are exhibited a series of forcible though rather slightly-executed sketches of "Native life in and around Tangier," by Mr. Aubrey Hunt, some drawings of Venice by MM. Vizzotto and Mainella, and a set (second series) of water-colour drawings of London churches, by Mr. C. H. Herne. These last are of considerable interest, and as far as artistic effect and colour are concerned they are drawings of a high order, and form a valuable series of illustrations of London topography. Unfortunately several of them are marred by bad drawing. In "St. Peter's, Cranley Gardens" (15) the spire is crooked; the tower of St. Mary-le-Strand (22) is out of drawing, the different stages not being set properly over each other; in "St. Margaret's Westminster" (24) the sketch of the clock-tower in the background is absurd; but the worst of all is the largest, a drawing of "St. Paul's at Daybreak" (20), very fine in effect and colour, but the dome is completely out of drawing, and looks as if it had been squeezed out of shape. It is extrordinary how few painters can draw a circular building in perspective. The two points constantly overlooked are, that the central portion of a horizontal cornice in this position is always a comparatively flat curve, dropping quickly into a sharper curve at the receding sides; and secondly, that the vanishing curves at each side must necessarily be exactly the same. In this drawing we have a sharply convex curve at one side and a nearly straight incline at the other. It might have been thought that any one undertaking a series of drawings of architecture would recognise that correct perspective was the necessary foundation for such work. Mr. Herne, it must be added, is by no means an exceptional sinner in regard to defects of this kind, which we have frequently seen in the works of artists of much greater reputation.

OUR Berlin correspondent writes that it will only be doing justice to the Berlin workmen to positively contradict all the statements that have appeared in the daily press charging them with participation in the tumults which occurred on Thursday and Friday last week in the streets of the Prussian capital. It is true that there is a great deal of distress and discontent in the city this month, owing to the artisans and labourers of the building trades, who are out of employment in the winter, not having their usual occupation with snow clearance; and it is also true that these unemployed, after having held a meeting in one of the suburbs, marched (some 3,000 strong) to the Town-hall to ask for relief works, and sent a deputation to the "Ober Buergermeister," who did not go to the trouble of even receiving them; but these men dispersed as quietly as they had come after they had found that they could not obtain a hearing. It was an entirely different crowd that took advantage of the apparent state of dissatisfaction among the workmen, a crowd made up of the scum of the populace,—roughs and idlers of the worst and most cowardly type. At present quiet reigns again as regards the roughs, and, as to those who really require help and whose discontent was unintentionally the indirect cause of the outbreak, we hear that the municipal authorities will vote some of the sums to be spent on works to be carried out according to next year's Budget, and that these works, which are then to be commenced at once, will give employment to several thousand men. The *bonâ-fide* workmen are exceedingly vexed about last week's occurrences, which have done much injury to their cause.

WE are glad to learn from a letter which appeared in the *Standard* last Friday, that a circular has been sent to many candidates for the London County Council, putting before them definitely as an object the suppression of the London organ-grinding nuisance, a matter which is not included, as far as we are aware, in any of the extensive promises of London reform and improvement put forth by many candidates. The following is the first portion of the circular referred to:—

"Sir,—It is earnestly requested that, if elected, you will endeavour to suppress the nuisance of organ-grinding. It may be seen, from a return presented to Parliament last year (Miscellaneous, No. 2, 1891, moved for by Mr. Jacoby), that this nuisance has been practically suppressed in all but English-speaking countries. Our law, however, amounts to a legislation of the nuisance, and puts difficulties in the way of those who want to protect themselves. No one has the right to complain at all, even at any hour of the night, unless on the ground of illness or occupation interfered with, and then you can only move them on, and they can come again as often as they please. If you will not suppress it, pray, at least, pass such regulations as will enable any one annoyed to promptly and effectually stop and prevent the recurrence of the nuisance within his hearing."

We have, we must confess, little hope of it, but we do earnestly wish that the next County Council would turn their thoughts towards eradicating once for all this intolerable nuisance of London life; a nuisance which is a source of continual misery and irritation to thousands; for which there is no sort of excuse; which affords opportunity to a host of idle vagabonds to avoid honest work and to prey upon and harass the community. There is nothing like it, in extent, we believe, in any other capital in the world; its existence is a disgrace to the Government of London, and the County Council ought to put it down with a strong hand.

THE LAND ON THE VICTORIA EMBANKMENT.—The *City Press* says that there is no truth in the rumour that the Corporation has at last received a satisfactory bid for the vacant land on the Victoria Embankment. There are several offers besides that of the Salvation Army before the City Lands Committee, but neither of them is considered satisfactory, being far below the value of the land fixed by the Corporation's Surveyor.

LETTER FROM PARIS.

LAST month saw a perfect avalanche of snow in Paris, which for three days pretty nearly stopped all street traffic. This event, not so very extraordinary at this time of year, has been the occasion of a storm of exaggerated accusations against the Direction des Travaux, even extending to personal invective against M. Huet, who three months ago succeeded M. Alphand as Inspecteur Général du Ponts et Chaussées, coupled with lamentations over the death of the latter, who it was said would never have left the Parisians thus stuck in an ocean of snow and mud. As a matter of fact however the same reproaches were uttered twenty years ago under the same circumstances, and on December 15, 1871, the Municipal Council of Paris demanded the immediate dismissal of M. Alphand, who was accused of carelessness in having taken no sufficient measures for removing the snow. It is amusing to note that among the signatures to this demand was that of M. Lockroy, who, when he became Minister of Commerce, appointed Alphand to the post of Director of the Works for the 1889 Exhibition.

The recent criticisms against the engineers of the Paris Municipality are certainly unjust and exaggerated, and the fact is that the corps of the Ponts et Chaussées department has shown a great deal of activity, but there seems to be a want of unity and of a fixed system of direction since the death of Alphand, who was a man of prompt decision and an admirable organiser of labour. In this respect the municipal services require improvement and rearrangement, and if any scheme of reorganisation is carried out it may be hoped that architects, who have been rather left out lately, will be given their old place in the service, instead of everything being left to the engineers.

At the Gallery of the Water-colour Society the celebrated water-colour by Meissonier, "1807," has been on view, taking the place of honour in the Galérie Petit; the work will probably be remembered by many in England, having been already exhibited both in London and at the 1889 Exhibition at Paris. The exhibition of the "Aquarellistes," after fourteen years of existence, is as prosperous as ever. M. Detaille, in his "Charge de Cavalerie," rivals Meissonier himself, and in minuteness of detail the picture almost suggests a coloured photograph. M. Besnard, in his fantasies, seems to be amusing himself by puzzling the good public. It is absolutely impossible to understand the meaning of his gigantic "Éléphants du Roi Baskir" tossing about women in their trunks at the edge of a cascade; M. Besnard seems in this case to have succeeded in even burlesquing himself. Among other exhibits is a fine collection of landscapes by M. Harpignies, powerfully treated though a little dry. A new comer, M. Paul Lecomte, sends some beautiful works, which at once give him a high rank among the landscape painters of the day. There are also some fine landscapes by M. Zuber, and some pretty Venetian scenes by the Baronne de Rothschild.

The President of the "Aquarellistes," M. Vibert, not only continues to inflict on us every year his eternal figures of cardinals, but these carefully-painted ecclesiastics meet us again at the "Cercle de l'Union Artistique," which has also opened its doors. This exhibition holds a good place among the smaller annual collections, and contains this year seven or eight works of great interest by such artists as Bonnat, Carolus Duran, Dagnan-Bouveret, Gervex, and Cormon; compared with which the remainder of the works impress one as rather mediocre and amateurish.

At the Palais de l'Industrie the new exhibition of "Femmes Peintres et Sculpteurs" has opened. It is the eleventh of the series, and it must be confessed that it is as mediocre in character as any of its predecessors. Two or three more such exhibitions will probably succeed in finally wearying the public of this attempt at feminine emancipation in art. The only exceptions to the general level of poverty are the sea pieces by Mdme. Elodie La Villette, the cats of that able animal painter Mdme. Ronner, and the studies by Mdme. Berria Blanc.

Among the minor exhibitions are to be noted the "exhibitions particuliers" of MM. Iwill, Huas, Gagliardini, and Pissaro. M. Iwill is an artist who excels in cloud effects and in autumn mists. His pictures, collected at the "Galerie des Artistes, Modernes," Rue de la Paix, are landscapes of great charm and variety.

M. Huas and M. Gagliardini exhibit at the Galerie Petit. The former has made a specialty of portraits of infants and young girls, which he treats with a skilled hand and which show close observation of nature. The latter, who, in spite of his Italian name, is a native of Alsace, is a painter of the sunny landscapes, white houses, dusty roads and blue sky of Provence.

M. Pissaro, the acknowledged chief of the Impressionists, exhibits at the Galerie Durand Ruel seventy-two works in oil, which form a kind of *résumé* of the extremely odd and curious studies of a long and (in its way) conscientious artistic life. There is a decided relation between his work and that of M. Besnard, only that M. Pissaro is an Impressionist by temperament and M. Besnard by convention.

There has been talk lately of the formation of a syndicate of artists who are to look after the material interests of painters, to undertake their defence in case of litigation, and even to intervene between them and the Government to obtain official commissions. The scheme emanates from the "Société Libre des Artistes Français" presided over by M. Bartholdi. Many objections are raised against it, and it has not much chance of success; and in fact the "Société des Artistes Français" presided over by M. Bonnat constitutes a real professional syndicate quite sufficient for all the purposes which the proposed body could carry out. In connexion with this latter society it is proposed to introduce this year at the Salon of the Palais de l'Industrie an innovation already suggested at the Champ de Mars Salon, viz. the exhibition of products of industrial art. The idea however has raised a great deal of opposition, and acrimonious discussions which have led at present to no result. If the decision is in the negative, this will probably tend further to the success of the opposition exhibition of the Champ de Mars.*

At the Ecole des Beaux-Arts the Government has nominated occupants for the two vacant professional chairs. M. Jules Jacquet, President of the "Société des Graveurs au Burin," has been appointed Professor of Engraving in place of M. Henriquel Dupont. He is an artist of ability who has engraved various important works by Lefebvre, Cabanel, Meissonier, &c. Instruction in the history of French architecture is to be confided to M. Paul Boeswilwald, an architect reared in the traditions of Viollet-le-Duc, and who seems eminently fitted for the post.

We announced recently the intended purchase by the Municipality of Paris of the celebrated Hôtel de Sens. Though nothing is absolutely settled, it is hoped that the purchase will be carried out and this interesting building saved from demolition. The "Société des Amis des Monuments Parisiens" has interfered in its defence, and there is little doubt that the Municipal Council, always anxious to preserve remnants of old Paris, will vote the necessary funds. The Hôtel would be admirably suited for the arrangement of the historic collections now very much crowded in the Hôtel Carnavalet. It is a building with many curious historical associations, and though it has suffered much injury from decay and rough treatment, it still remains a fine monument of French architecture of its period. It will require a good deal of reparation, but if preserved it will be a building almost equal in interest to the Hôtel de Cluny, and it is important to preserve at least all we can of the architectural history of old Paris.

INSTITUTION OF CIVIL ENGINEERS.—Mr. Berkley, President of the Institution, entertained at dinner, at the Grand Hotel, on Thursday in last week, the following officers and past-officers of the Institution:—Sir Frederick Abel, K.C.B., hon. member; Mr. Abernethy, Sir Frederick Bramwell, Bart., F.R.S.; Mr. Woods and Sir George Bruce, Past-presidents; Mr. Alfred Giles, M.P., Sir Robert Rawlinson, K.C.B., and Sir B. Baker, K.C.M.G., F.R.S., Vice-presidents; Mr. G. F. Lyster, Mr. E. A. Cowper, Sir Jas. N. Douglass, F.R.S., Mr. J. W. Barry, Sir Douglas Fox, Mr. W. H. Preece, F.R.S., Dr. W. Anderson, F.R.S., Mr. Charles Hawksley, Mr. W. Shelford, Mr. J. C. Hawkshaw, Sir Bradford Leslie, K.C.I.E., and Sir Guildford Molesworth, K.C.I.E., Members of Council; Mr. Shand, Mr. Burt, Mr. H. Graham Harris, Mr. W. Matthews, Mr. F. S. Courtney, Mr. Berkley, jun., and Mr. James Forrest, the secretary.

* We may add, however, that the much-talked-of introduction of industrial art-work at this exhibition last year did not amount to anything worth speaking of, and the result was somewhat disappointing.—ED.

SARACENIC ARCHITECTURE.*

BY PROFESSOR AITCHISON, A.R.A.

ANY description of Saracenic architecture would be incomplete without a sketch of its ornament and colour.

It might not be impossible to pronounce the style of a late building to be Saracenic, even if it were stripped of its ornament; but I think that, unless its date were known, the question of its style might be open to controversy, and some might affirm that it was of a local Byzantine or Romanesque school; but if its ornamentation were given the only controversy that could arise would be as to whether it were purely Saracen or built under Saracen influences. The stalactites alone would settle the question.

That much of the Saracenic ornament that consists of purely geometrical arrangement was founded on the Byzantine does not, I think, admit of a doubt; some of the Saracenic geometrical patterns, and much of their ornament, is undoubtedly Byzantine; there are patterns shown in books on Saracenic art that may be found in the Byzantine ruins of Central Syria. What Saracenic architecture got from Chaldæa, from the Greek kingdom of Bactria, and from India, we know not; from Persian architecture it got something, but not much. Though Persia in Chosroes' time had shrunk to the Euphrates, it contained Assyria and Babylonia, and I believe still reached to the Indus, so I was technically right in saying that they borrowed their bearded battlements from the Persians, but these were probably of Chaldæan origin, and no doubt the Saracens got something from the Westerns during the days of the Crusades, and they probably got much from the Copts in Egypt. They were greatly troubled as to their ornament by the exigencies of the faith, for not only did a pious Moslem refuse to make the likeness of any living thing, but he was troubled for his *post-mortem* interests by even sitting with them in his own room. The President has got a curious illustration of this. Some Persian fire-worshipping potter, who pretended to be a Moslem, or some infidel Cufan, had painted tile panels of a park, with men fishing, in which were swans, peacocks, falcons taking game, and cheetahs seizing antelopes; a pious, but tasteful Moslem subsequently inhabited the house, and tried to make the best of both worlds: so he cut the throats of all the living things, and thus enjoyed their portraiture with a clear conscience. Some of the Fatemite Kaliphs and Turkish rulers of Egypt were not so strait-laced, and, not to speak of carpets and embroidery with wild-beast patterns on them, had animals painted on their shields, carved on the walls of their buildings, and engraved on their plate. The griffin of Pisa is an instance, and we do read of Saracen statues; the Pisan griffin had plaques on its forelegs, one engraved with a lion, the other with an eagle; it is said to have been made by the order of El Hakem, the Fatemite Kaliph of Egypt, between 996 and 1020, and to have been captured by the Crusaders. On the citadel of Cairo, built by order of our old friend Saladin, is a double-headed eagle, supposed to be his crest, and thought by some to be a piece of ancient Egyptian sculpture; but his eunuch who ordered and looked after the building was called "The Black Eagle," so it was possibly a rebus of his name. In Kalaun's mad-house are carved friezes of wood, with hunting martichores, antelopes, falcons, peacocks, and figures of men drinking or playing musical instruments; these are introduced in medallions or amid foliage. The martichore is an animal which Mahomet saw in Paradise; it had the feet of an antelope, the tail of a tiger, and the head of a woman; it is this martichore that is in the mad-house of Kalaun. Some such beast, however, called by the same name, was said to have been hunted by Apollonius of Tyana in India. His beast had the head of a man and the body of a lion. Apollonius lived in Nero's and Vespasian's time, but martichores are said to have been spoken of by Ctesias 400 years before.

Apollonius, too, was a prophet, and a statue of him was in the hall or chapel where Severus Alexander had statues of illustrious persons and prophets, among whom were Alexander the Great, Moses, and our Saviour. Many of the

* Being the sixth and last Royal Academy Lecture on Architecture this session. Delivered on Thursday evening, February 11.

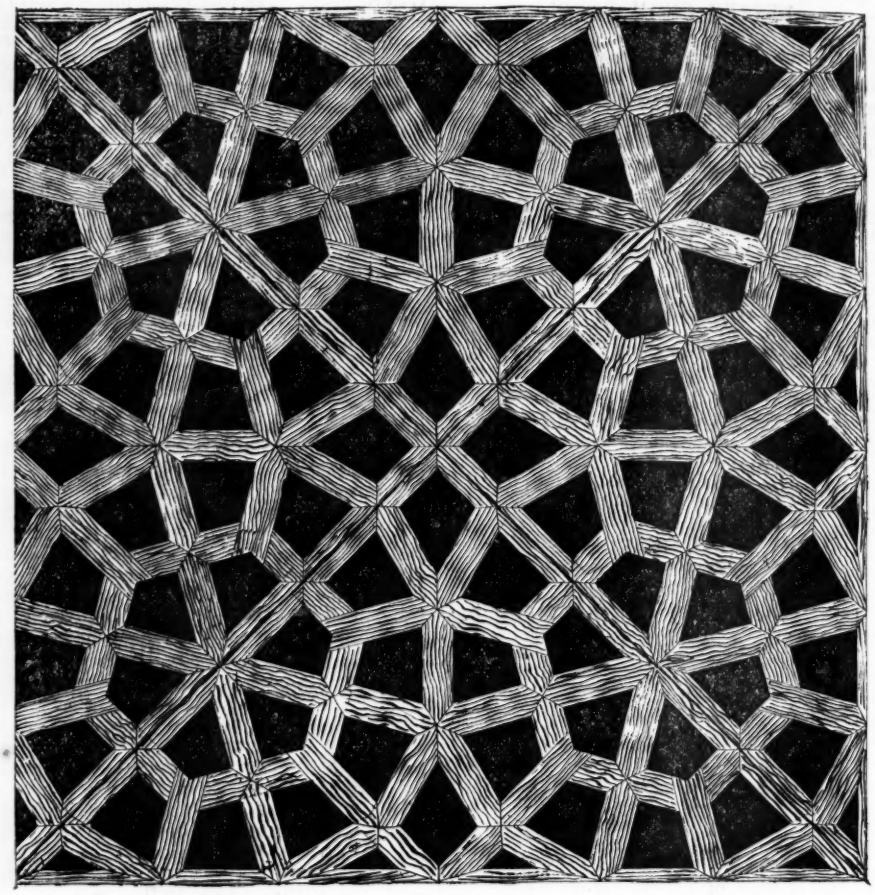
hand-mirrors of Saracen manufacture had martichores, animals, and hunting scenes on their backs. The ivory coffer of Bayeux has its hinges and angle and face clamps of silver, beaten up and chased into peacocks and flowers, enamelled in blue and parcel-gilt; it is supposed by some antiquaries to be Saracen work of the twelfth century, on account of the style of the Arabic writing which forms an inscription round the lock; it was deciphered by Petis de La Croix, in 1714. The legend is the common one found on hand-mirrors and such-like objects. "In the name of God, the merciful, the compassionate, perfect blessing and complete happiness," to my possessor being understood. It is supposed to have been part of the plunder brought by St. Louis from the Crusades. Some antiquaries, however, attribute it to the days of that Abd-al-Rahman who was killed at the battle of Tours, 732 A.D., and say it was then found in the Saracen camp; it certainly has not got the geometrical forms that were prevalent at the later date, but one requires to be acquainted with the Saracen plate to give a definite opinion.

Some of Kalaun's and other Sultans' plate, candlesticks, plates, water-buckets, flambeau stands, vases, and ink-horns, are ornamented with animals or figures; one candlestick has a medallion with birds round the edge; a plate has a medallion with fish nibbling at a bit of bread, with their tails curved like the flower of the cyclamen; the bottom of a water-bucket is damascened with a shoal of silver fish; a flambeau stand is damascened with gold and silver on a *niello* ground, and has bands of hounds, stags, elephants, and winged horses, as well as figures of men and hunting scenes.

When we get into the thirteenth century, the Easterns and Westerns had got mutually acquainted by a century of fighting, and whether this taste for animals and figures was aroused in the Saracen by the Crusaders, or was merely dependent on the tastes of the rulers, or whether the Muftis had agreed that the portraitures of men and animals was not sinful, but was only forbidden in mosques, I know not, but Saracen books of the thirteenth century are to be found illustrated with pictures of men and animals, no longer confined to scrolls and medallions, but forming whole page illustrations. These may be seen in an illuminated MSS. of the sittings of Hariry, a book of anecdotes of an adventurer: it was written in pure Arabic by a believing Moslem who was a poet, the author being a native of Saroudj, a small town in Mesopotamia, but the illustrations are supposed to be by Yahia-el-Wassety, a Persian artist, and to have been done in Cairo in 1236 A.D.; the borders have scrolls with cheetahs, stags, hares, and foxes, and in the spandrels of one page are winged figures with the nimbus.

The writing-masters, too, formed texts from the Koran into ducks, eagles, lions, and men on horseback. The Fatemy Kaliphs and the Mamluk Sultans and their followers had a passion for silk; the Moslems, who had still before their eyes the Prophet's objection to silk, evaded it by using cotton with the silk. The curtains of the Kaaba were woven at Cairo of cotton and silk dyed black, the colour of the Abbassides. It was Mehdy, the father of Harun al Rashid, who first stripped off the old coverings. As soon as silk came into vogue, the royal patterns of Byzantium, Persia, and Egypt seem to have been adopted by the Saracens, and many of them had figures or animals woven in them with inscriptions in Arabic, mostly in Cufic characters. Pliny speaks of the embroidered work of the Parthians and Babylonians as well as the "Attalicæ vestes," and, without doubt, the wild beast patterns of India were known at an early date. Plautus speaks of "the purple carpets of Alexandria" with "wild beast patterns" (Pseudolus 1, 2, 14). Quintus Curtius speaks of the robes of the Persian satraps, ornamented with golden falcons which rush at one another like the beaks of ships, and, not to speak of the band of figures on Minerva's robe, we all know the imperial purple robe of Theodora in San Vitale, with the Adoration of the Magi on it. The Copts seem to have been the designers and weavers of the Egyptian stuffs with figures, which included wild beast patterns.

Persian and Byzantine artists and workmen designed and wove other stuffs ornamented with animals and human figures. Under a Turkish Governor, Iconium in Lycaonia, the Rûm of the Saracens, seems to have been a great centre of manufacture; one of the patterns preserved in the Lyons Museum is of the first half of the thirteenth century, was produced at Iconium, and consists of two lions back to back in gold on a crimson ground; it has rather a Chinese air about it, the claws being like those of the Chinese dragon: and the Saracens had intercourse with China. The manufacture was also carried on by the Saracens when they were masters of Sicily, and was continued by Saracen artists and workmen when it fell under Christian sway. The fabrics of the Saracens were so celebrated that many materials bear their name to this day: "Damask" from Damascus, though I believe this got the name before Saracen days; "Sarcenet" from Saracenicum,—Shakespeare speaks of "a green sarcenet flap for a sore eye;" "Muslin" from Mosul, "Dimity" from Damietta, and "Tabby" from a quarter of Baghdad, called so after Prince Attab, a great grandson of Omeyya; "Mohair," from the Arabic name for stuff of goats' hair, now called "Moire," which is watered silk.



Trellis, Cairo.

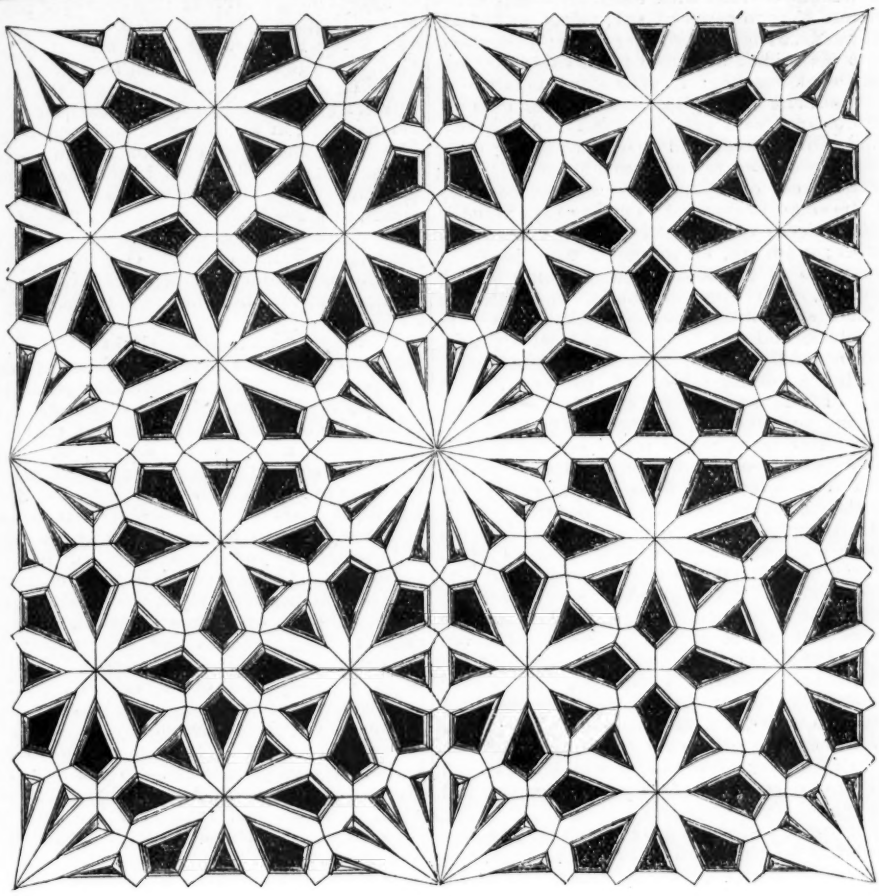
> "And when she sees her friend in deep despair,
> Observes how much a chintz exceeds mohair."
> *Pope.*

Saracen artists and workmen were also employed by the Christians at Lucca, Venice, and elsewhere, just as the oriental carpets of Poland in the seventeenth century were made by Persians. When the art was learnt, the manufacture was often carried on by Christians, who not unfrequently made a mess of the inscriptions. Whether we have any remains of the stuffs that were actually worked by Moslem hands in Moslem countries seems doubtful, but we have plenty of copies or imitations, mostly to be found in the treasures of churches or in textile museums. Nearly all the thirteenth and fourteenth-century textile fabrics of Europe were based on Saracen designs. We know that the Renaissance book-bindings, as late as Grolier, often retained the Saracen patterns.

The Saracens followed the Byzantine habits, and royal stuffs were not to be had for love or money.

In Byzantine times the mere possession of a mantle of imperial purple was enough to found a charge of high treason on, and to subject the possessor to torture and probably to death At Tinnis there was a factory for royal robes. Amongst other articles it manufactured was an iridescent stuff called "Chameleon"; the cost of a piece of this for a turban was fifty pieces of gold. It is said that a king of Fars offered 20,000 pieces of gold for a royal robe of Tinnis stuff, and sent an agent to get it, who, after trying for several years, gave it up in despair. The price of some of the more precious stuffs was fabulous, but I presume that the robe that cost 400,000 pieces of gold, which Harun-al-Rashid cajoled Jafar with, before he cut his head off, was embroidered with precious stones like Chosroes' carpets, that the Saracens sold by auction at Medina. Embroidery was largely employed on dresses of honour, as well as on the coverings of tents. In the inventory of the Fatemite Kaliph El Mustansir, in 1035-95 A.D., tents are described, made of cloth of gold, velvet, satin, damask, and silk; some plain, some embroidered with men, elephants, lions, peacocks, and horses, and lined with velvet, satin, or silk shot with gold. Some of these tents would contain 150 horsemen, had poles 65 cubits high, nearly 100 ft., and took seventy-two camels to carry them, each camel load being 1,000 lbs. The "Arabian Nights," which represents the manners and customs prevalent amongst the last Mamluk Sultans, is full of descriptions of embroidery. You must not suppose that this was an original Saracen art; the Romans employed it largely, and it is more than suspected that some of the large chambers in Diocletian's palace were workshops for it. In the story of Seyf-el-Muluk, he sees on the tunic sent to his father by King Solomon, "the portrait of a damsel delineated in gold," and this was so well done that he incontinently fell in love with her, travelled into barbarous countries, and endured all sorts of hardships and horrors to find her. In the City of Brass "the party entered a passage paved with marble, upon the sides of which were curtains, whereon were figured various wild beasts and birds, all these being worked with red, gold, and white silver, and their eyes were of pearls and jacinths; whoever beheld them was confounded." In the story of Alee Shîr and Zumurrud, the professional embroideress, she said to him, "Buy for us a piece of silk, as much as will suffice for a curtain, and buy gold and silver thread, and silk thread of seven different colours. . . . . The damsel took the curtain and embroidered it with coloured silks, and ornamented it with gold and silver thread. She worked a border to it with figures of birds, and represented around it the figures of wild beasts, and there was not a beast in the world that she omitted to portray upon it."

I have gone rather far afield before coming



Trellis-work at Rosetta, Egypt.

to the great invention of the Saracens, their ornament, founded on æsthetic geometry, but, after all, I have but given the exceptions before the rule, and I have incidentally shown what we owe to them and to their passion for magnificence. I may remind you that Saracen art only admits at present of the slightest sketch, for with the exception of a few Arabic scholars, almost nothing is known in the present day of the Saracens, of their achievements, literature, arts, and sciences, and dates are out of the question, for if we know when a structure was originally built, we do not know how often it has been burnt down, rebuilt, added to, and altered. There is a story told of a flippant remark made by the late Lord Beaconsfield when a lad. The Ministry were dining with his father, and he was asked in to dessert; they were talking of the Eastern question, when he broke in by saying, "You fellows are always talking about the Eastern question, but all that you know about the East is what you have read of it in the 'Arabian Nights,'" and this is a very fair description of what most people know of it. We architects know its domes and minarets, its stalactites and curious geometric patterns; and of these last the star-shaped patterns with wide blunt points are best known, and these, with the filling between them, the French call "mail." In spite of the exceptions given, it seems most probable that the bulk of the population who could afford to build, to decorate, to have fine furniture or clothes, preferred patterns that did not contravene the glosses on the Koran, for the only prohibition I have been able to find in the Koran is against worshipping idols. Mohammed's well-known dislike of chessmen, in the shape of men or animals, is a personal anecdote of the Prophet told by one of the "Companions." The architects, decorators, and designers must consequently have been hard put to it to find out what would enable persons to indulge their taste for richness and magnificence, without wounding their consciences or causing scandal to their friends. At last the prevalence of geometric studies solved the difficulty. The Byzantines, and especially those of Central Syria, had started ornamental designs composed of geometric figures, and the Saracens carried this form of ornament to the greatest length it has yet reached.

It is evident that the geometers revelled in their science, which must have been new to them, and one section of them turned it into a useful art,—that is, this section saw how geometrical arrangements might be used as architectural enrichments, and how they might form a framework for floral ornament. The geometers doubtless began by making geometric figures of every conceivable shape, and tried with what figures they could fill them, and into what forms they could decompose them; they then tried what simple geometric figures would cover any simple rectangular space; then what combinations of geometrical figures would do the same, until they became adepts and saw fresh possibilities of variation and invention. These rectilinear geometrical arrangements were carved on stone and marble, were used for inlaid patterns on marble or tiles, were employed for mosaic pavements, for pierced stone and marble work, for wooden lattices and doors, and for wood, plaster, and metal work.

The frets and interlacing rectilinear patterns of early civilisation were doubtless suggested to the artistic embroideress or primitive weaver with the needle, by stuffs being formed of a succession of squares, and the Saracen geometers probably worked their interlaced patterns on squared paper or boards; their practice and ingenuity enabled them to make those frets and interlacings much more elaborate and intricate. The descriptions of their geometric ornament must be short, for this subject alone would be enough for six lectures, and you have had as well a sketch of the new architecture, in nearly every country of the ancient world. Great ingenuity is shown in the turned lattices, mostly used to fill in meshrebiyas and windows; the effect of these is always quaint, and occasionally artistic.

One lattice, exhibited, is made up of dodecagons with four-limbed stars between them, and is redeemed from monotony by the figures being set out on a framework of squares set lozenge-wise. This enabled the designer to make some of the main horizontal and vertical lines wavy; in fact, these wavy lines made another pattern of octagons and stars. It gives variety, it is true, but it also has the defect of making the ornament look as if it were alive, for your eye is being continually attracted from one pattern to the other. In another case, set out on the same network, solid sixteen-sided stars are put at the intersections, and the space between them is filled with irregular heptagons, the bars within them forming an eight-limbed star. A very wild pattern is made on hexagonal tiles by dividing each side into five equal parts, putting a square anglewise on it, and producing the sides of the square; this forms a pattern of interlacing irregular hexagons with a central starred polygon. The star-shaped figures constructed from polygons are undoubtedly the most common, striking, and characteristic Saracen patterns. I should only be tiresome if I completely described their setting-out, but I may say that a network of equilateral triangles is first set-out, on whose points circles are described, and the spaces between the circles are then filled in with circles touching the former. I have given M. Bourgoin's solution of the pattern on the door of Bibar I.'s mosque, but it will not tell much to those unacquainted with the subject. If you will look at the mail-clad door itself (see lithograph), and see the lines that seem to run about at haphazard, you will come away with the notion that the work could not have been done by mortal hands; the bronze mail of the door seems to have been cast, chased, and probably damascened; the green patina is owing to neglect. There is little doubt that the bronze work was originally bright, in imitation of the gold-plated doors of the Kaaba; the lines between show the native colour of the wood. The genus of the pattern is very common, but its sculptural treatment, I think, shows genius. It looks like an idealised alligator's skin in bronze; its wonderful effect is got very simply; only eight out of the twelve whole smaller stars have their points enriched with a drop-shaped boss; all the other stars and half stars are only enriched with central bosses, the big stars having bigger bosses. A very similar pattern, only wholly in bronze, is rendered quite commonplace and monotonous by all the big and little stars having these drop-shaped bosses on each point.

Some of the patterns,—*e.g.*, the one carved on the lintel of the fountain of Kaït Bey, and some carved marble from the mosque of Sultan Hasan,—are what used to be called a "thunder and-lightning pattern," and some from Kaït Bey's Wekala or Khan seem to defy solution.

You will observe that, with a true instinct for ornament, the pure rectilinear decoration is mostly interspersed with floral ornament, or else floral patterns are filled into the geometrical panels. As I before said, most of the plaster ornament for walls and ceilings cannot be judged of without the colour; and the artists of Cairo and Syria have treated their work in a most artistic way, so that you find coloured patterns of great originality and effectiveness.

Much of the maddening intricate work is left plain, or but slightly relieved from the ground, and the stars, panels, or coffers are delicately or powerfully brought out, so as to please the educated eye. There is little doubt that the curved patterns after the Byzantine or Romanesque manner were designed on some geometrical framework. Were it not for the magical changing of patterns, the colouring at the Alhambra is rather too cloying.

We must allow that the exclusion of animal life was the main cause of the invention of a new style of ornament, and it is not surprising that this original invention of their own should have delighted the Saracens; we must allow that without it the world would have been so much the poorer.

I have so often said before that the highest art always looks so simple, unaffected, and natural, that we are apt to grudge the artist doing it before us. As St. Augustine is reported to have said, "Cursed be those who say our good things before us," but there is no harm in saying it again. Anything that strikes us as being ingenious, puzzling, quaint, or odd, falls into a lower category; but, as the human mind is fond of novelty, we ought to be grateful to those who give us original variety. One of the charms in Saracen art is the unexpectedness of the shapes in their ornament, and the strangeness of its application; sometimes we see whole ranges of plain panelling, with one panel filled with "thunder and lightning"; sometimes a doorway is framed, and outside this the wall breaks out into ornamental panels like wings; and we, at least, are unaccustomed to those deeply-moulded angles which bring the square bases into octagons for the domes to spring from and to cylindrical parts, the domes being covered with elaborate ornament.

The description of the presentation of the Byzantine Ambassadors to El Muktadir has become rather hackneyed, but the cause is that the writers of the "Arabian Nights" have stock phrases about buildings, that convey little to our minds. They are described as elevated

pavilions, containing lofty chambers; or palaces are described as magnificent buildings with lofty angles. The great hall of the palace in the City of Brass is described as "a saloon constructed of polished marble, adorned with jewels. The beholder imagined that upon its floor was running water. . . . . They found in it a great dome, constructed of stones, gilded with red gold . . . . and in the midst of that dome was a great dome-crowned structure of alabaster, around which were lattice-windows, decorated and adorned with oblong emeralds, such as none of the kings could procure. In it was a pavilion of brocade, raised upon columns of red gold. Within this were birds, the feet of which were of emeralds. Beneath each bird was a net of brilliant pearls, spread over a fountain; and by the brink of the fountain was placed a couch, adorned with pearls and jacinths, whereon was a damsel resembling the shining sun."

The decoration is briefly described as interlaced work, painted with vermilion, ultramarine, and gold. The hearers of stories were evidently satisfied with a slight description that implied grandeur and magnificent colour, but they were more curious about costly silks, satins, and embroidery, jewels and gold.

Whatever may be said against the sumptuousness and magnificence of clothes, personal adornments, furniture, and the architecture and decoration of private houses, I have always found them to exist when there was admirable architecture in public monuments.

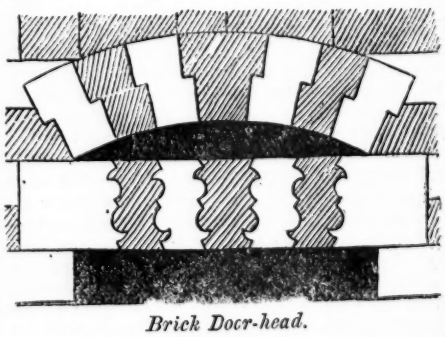
In the golden age of Rome, Julius Cæsar wore shoes enriched with engraved gems; and we know from Petronius and Martial, in the silver age of Roman architecture, the splendid shawls and dresses, and the Babylonian embroideries with which the couches of the dining-rooms were covered: even as early as Plautus we hear of the carpets of Egypt with wild beast patterns, and the choice colours of ladies' dresses. I think there are many reasons for this. In the first place, there could hardly be sufficient employment in public monuments alone, to give the due reward and the necessary practice in the arts, nor could there be a sufficient taste created in those who ordered public buildings nor in those who admired them, if there were nothing but plain white robes, plain houses, and whitewash. I think, too, Hume's argument may be reversed, for where there are not excellent carpenters, weavers, stonemasons, and the like, we can hardly expect the master arts to flourish,—and architecture is one of the master arts. Be this as it may, I think it is evident that what are now called the sumptuary arts kept pace with architectural art, or architectural art kept pace with the sumptuary arts. The finest mosques,—viz., from the twelfth to the fifteenth century,—were contemporary with the most gorgeous stuffs, the finest cabinet, metal, glass, and enamelled work,—in fact, much of it was used for the decoration and furnishing of the mosques.

We fortunately have an inventory of the plate, jewels, stuffs, and furniture of the Fatemite Kaliph Mustansir that were sold by auction. He reigned from 1035 to 1094, just before the Crusades. I will give you a list of the most striking things. Besides bushels of uncut emeralds and necklaces, each bushel being worth 300,000 pieces of gold, there were 1,200 gold and silver rings, ornamented with gems which had cost 600,000 pieces of gold,—these surely must have been bangles; beer-jugs of the finest carved crystal; 18,000 crystal vases, amongst which were an enormous water-bottle and bowl, perfectly clear, and of the most exquisite workmanship; dishes of gold, some enamelled in patterns; 9,000 caskets of precious woods, enriched with gold, and lined with silk; a hundred cups of bezoar stone, on the greater part of which was engraved the name of the Kaliph Harun-al-Rashid,—the Arab word bezoar means an antidote to poison; inkhorns of different shapes, of gold, silver, sandal, aloe, and every other sort of wood, and of ivory, enriched with gems, gold, or silver, and remarkable for the excellence of the workmanship. The gold marriage-mat of Mamun, with his name on it; twenty-eight enamelled dishes enriched with gold, that had been presented to the Kaliph Aziz by the Byzantine Emperor, each of the value of 3,000 pieces of gold; chests full of hand-mirrors of steel, porcelain, and glass, enriched with filigree work of gold and silver, some bordered with jewels and with handles of cornelian or fine stones,—one had its handle covered with emeralds,—and these mirrors were in cases of silk, velvet, or beautiful woods, with gold or silver locks; a thousand articles enriched with gold, remarkable for their fine workmanship; a prodigious number of pieces of silk for playing chess and draughts on, embroidered with gold, with the men of ebony, ivory, silver, gold, and precious stones; 6,000 gold flower-pots for narcissus bulbs or violets; 36,000 pieces of crystal, and an enormous box of the same, sculptured; knives of the value of 36,000 pieces of gold; 22,000 large pieces of amber; a turban, embroidered with jewels of the value of 130,000 pieces of gold; a gold peacock, with eyes of rubies, enamelled in colours after nature; a gold cock, with a crest of rubies, and the body covered with pearls, and a gold gazelle, also ornamented with jewels; a dining-table, of sardonyx, with legs of the same, big enough for several persons to dine at; a garden of silver gilt, with silver trees, whose fruits were of jewels; and a palm-tree of gold, enriched with pearls, with the growing dates represented by jewels in every degree of maturity, in a golden box. Among a multitude of carpets woven with gold thread, were a thousand representing the different dynasties, with portraits of the kings and celebrated men, inscribed with their names, dates, and principal works. There was a map of the world woven in blue and gold tissue, with the names of the seas, rivers, countries, mountains, and towns; besides these were tons of camphor, moulded into cups, fruits, &c., and sacks of musk; there were specimens of the fine porcelain of Persia and China; arms, armour, and standards; and the tents were extraordinary both for size and the splendour of their stuffs.

One tent, called the great rotunda, was supported by a single upright, 97 ft. 6 in. high, and said to be nearly 10 ft. diameter. It was a column presented by the Byzantine Emperor, The tent was about 250 ft. diameter. It took 100 camels to carry it, *i.e.*, the column, the cords, and the vessels for the Sultan's use. The hangings of the tent were adorned with the figures of animals, and as part of its fittings it had a vast sea of silver. It is said to have taken 150 workmen for three years to make, and to have cost 30,000 pieces of gold. Some of the tents were supported by silver pillars, and the hangings were of cloth of gold, velvet, damask, and silk of every colour embroidered with men and animals often in gold embroidery. One tent was called the "Crusher," because a man was always crushed in pitching it. One may be sure that all the appointments were on a corresponding scale of splendour. When the Sultan reviewed his troops or held a durbar, there were gold or silver lavers, gold plate enriched with jewels or enamelled, candlesticks, swinging censers of the precious metals, enamelled or enriched with precious stones; the tables made of more common materials were of exquisite workmanship, the goblets and cups of crystal, gold, jasper, or agate, enriched with gems. Most of us have seen the precious cups, ewers, and centre-pieces in the Louvre, but it is their artistic merits we most admire; but at Madrid there are cups of gold as big as sugar-basins, rough with carving, and large masses of turquoise; these, the most gorgeous-looking things I have ever seen, are said to be presents from the East. Golden ewers and basins with their silk towels embroidered at the ends, and whenever they drank they had vases of flowers and dishes of fruit. A pageant of this sort must have exceeded anything we can imagine, the Sultan sitting on his throne, as often as not plainly dressed, surrounded by his Viziers and officers of the pen, all clothed in gorgeously-coloured dresses embroidered with gold and precious stones, and behind them black eunuchs and handsome page-boys, and environed by his guards, in sumptuous damascened or burnished armour; while the cavalry, on high-bred horses, pranced and curvetted in front of the tent, with their armour damascened, or clad in gilded mail, their sword and dagger hilts and scabbards jewelled, their baldricks stiff with many gems, and necklaces of jewels, with their horse cloths of cut velvet, embroidered satin or cloth of gold. On great festivals, when the army formed itself into a procession through the principal streets, the roads were strewn with green leaves and flowers, and the houses were all hung with costly carpets, velvets, and embroidered silks, the standards flying, and the people deafened by the tramp of horses, the clang of armour, and the blare of trumpets, as they escorted the Sultan to a great mosque, through the crowds of people. Most of the poor were barefooted, with blue gowns and white turbans, the girls with their long blue or white face-veils, with beads and coins dangling on their foreheads, and the whole ceremony finishing by a public banquet in the horse course, in which the banquet was spread. The huge dishes towered to a man's height above the table, filled with baked sheep, fowls, and small birds, filled between with dry sweetmeats, and the table covered with flowers. In spite of all this magnificence, "uneasy lies the head that wears a crown." One of the sleepless Sultans had a pond of quicksilver made in his garden, and here he tried to woo sleep on an air bed.

I have now given you a slight sketch of the Saracens from "the days of ignorance" to their acceptance of Islâm; of their emergence from their native land and of their conquests of the principal countries of the ancient world; of their early mosques in Europe, Asia, and Africa; of some of the leading characteristics of the style in Egypt, Persia, Barbary, and Spain. I have, too, pointed out the chief characteristics of the style when it became purely Saracenic. I have given you some hints of how the geometric ornament, which is most characteristic of the perfected style, was produced, and some account of Saracen manufactures, so that nothing remains for me to say but to draw an architectural moral. Nothing is to be despaired of in our art, so long as we have virtue, energy, industry, and perseverance; accompanied by a desire to improve it, to give it the character of our age, and of our own personality. In the Byzantine lectures of last year,* I showed you that even when a nation had sunk very low, and was engaged in a death struggle with savages, there was still hope, if the architects would only keep pace with the advance of knowledge, throw off self-imposed fetters, and work out truthfully and boldly the problems they had to solve; that, even then, a style might gradually be evolved, which would charm its contemporaries and elicit the admiration of succeeding ages; an example of the truth of this may be seen in Sta. Sophia of Constantinople.

In the Saracenic style you see that a race composed of barbarians and savages, almost destitute of the commonest arts of life, but fraught with courage, energy, and enthusiasm, could gradually acquire the architectural skill that had preceded it, and carry architecture, in certain directions, to a height it had never reached before; for nothing more fantastic and magical has ever been produced. This was mainly due to an ardent pursuit of geometry, and geometry is the foundation of all architecture.



Brick Door-head.

We, like them, have most of the architecture of the world before us, at least in engravings and photographs, and since the Crusades there has never been so much travelling. During my lifetime never has such energy been displayed by young architects and students, and never have the means of acquiring a knowledge of the principles of architecture been so near the hand of students. Shall we, then, "who rift the hills and roll the waters, flash the lightnings, weigh the sun," abandon ourselves to despair, and think we are not able to surpass our predecessors? No. We must, however, remember that man's power is limited, and a new style is neither to be created in a day nor in a lifetime; all we can do is to learn the elements of architecture,—a tremendous task, I must allow,—not copy, and understand that all that an architect can do to show his skill, taste, and the mighty thoughts within him, is by building. When we have mastered the grand fundamental

* Published in the *Builder* at the time.

principles of this almost infinite art, we can only do our best with those powers with which we are endowed; but depend upon it that when you have mastered the art, and have something beautiful or great to express, you will impress those with whom you mix, and they will entrust you with their work.

I fear, however, that the rising architects are too open to the ungallant remark of Swift about the young ladies of his day, that they were busy in making nets rather than cages. Showy draughtsmanship may get the most work, but when you can plan conveniently and construct soundly, fine composition, subtle proportion, and elegant profiling will ensure the most lasting fame.

COMPETITIONS.

BOROUGH LUNATIC ASYLUM, SUNDERLAND.—In the recent competition for the new Sunderland Lunatic Asylum, in which Mr. Howell, of London, acted as assessor, the first premium has been awarded to "Scio," Mr. George T. Hine, London, the architect for the Claybury Asylum; the second to Messrs. Hine & Odgers, Plymouth, whose motto was "Turpi secernis honestum"; the third to Messrs. Giles & Gough, London.

PROPOSED TECHNICAL SCHOOL, ASTON MANOR, BIRMINGHAM.—At a meeting of the General Committee, held on the 29th ult., the designs under *nom de plume* "Science and Art" were accepted, and the author of them, Mr. Geo. H. Cox, of Birmingham, was appointed architect for the new buildings.

BLACKBURN COUNTY BOROUGH ASYLUM.—We understand that the plans for this competition, confined to architects practising in Blackburn, were sent in on February 29. The assessors appointed are Messrs. Hine & Odgers, architects, Plymouth.

ARCHITECTURAL SOCIETIES

CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING ASSOCIATION.—The usual fortnightly meeting of this Association was held on Tuesday last in the Town Hall, when a paper on "Trigonometrical Surveying" was read by Mr. A. Turley, C.E. The most approved methods of surveying and mapping large areas was fully described. A system of traversing and planning without the use of the protractor, ensuring most accurate results, was fully dealt with.

EDINBURGH ARCHITECTURAL ASSOCIATION. On the 27th ult. the Edinburgh Architectural Association visited St. Nicholas' Church, Dalkeith. Mr. Hippolyte J. Blanc, who conducted the party, described the building as one of the collegiate churches, so many of which were founded in Scotland during the fifteenth century. A few were erected at the end of the fourteenth century, of which he noted that at Dalkeith as one. Mr. Blanc traced the various changes which the fabric had undergone, explaining in detail the characteristic features in the door, windows, and buttresses. He also illustrated his exposition by a series of drawings prepared from measurements of several other collegiate churches built during the fifteenth century, and which bear all the characteristic detail found at St. Nicholas'. Mr. Blanc was thanked for his lecture, and for the manner in which he had exhausted all the points of interest in his subject. The party thereafter proceeded to Newbattle Abbey, which, through the courtesy of Lord Lothian, they were enabled to visit, Mr. Archibald Macpherson acting as leader. The Abbey stands on the site of a Cistercian monastery, founded by David, the "sair sanct for the Croon," in the twelfth century—1140. The excavations made by the directions of Lord Lothian several years ago exposed the foundations of the church and some remains of the walls of the conventual residence. The church, which measured 239 ft. long and 57 ft. broad, consisted of nave with aisles, short transepts, and square-headed apse. The examinations of the remains fully bore out the theory that Newbattle shared the fate of other churches and abbeys when Richard II. of England and John of Gaunt made their expedition across the Border, burning and destroying the religious edifices on their way. It is supposed that it was restored in the fourteenth century. The party thereafter were shown through the Mansion-house. At the close of the proceedings, a hearty vote of thanks was accorded Lord Lothian for his kindness, and to Mr. Macpherson for his paper.

GLASGOW ARCHITECTURAL ASSOCIATION.—The annual supper of this Association was held on the 23rd ult., in the Grand Hotel, Glasgow. The honorary president, Mr. William Forrest Salmon, F.R.I.B.A., occupied the chair, and there was an attendance of about forty members and guests. The chairman, in speaking to the toast of "The Association," congratulated the members on its continued prosperity. He also announced that the Travelling Studentship had been gained by Mr. Eric A. Sutherland, Kelvinside, for his designs for an Art Gallery and Museum, submitted in competition with five others.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At a meeting of this Society held on Monday night in the Law Institute, Leeds, Mr. Beresford Pite (London) read a paper on "The Architecture of Michelangelo." After describing the early life and training of the great architect, sculptor, and painter, the lecturer said Michelangelo did not undertake architecture until he was forty years of age. He was born in 1474, and died in 1563, at the age of ninety years, having spent seventy years in working. He was the contemporary of Raphael, Bramante, and Sa. Gallo, who all died before he had begun his work at St. Peter's. Bramante began St. Peter's in 1502, and Michelangelo followed him in 1540. The church was not completed till the next century. His work was characterised by great originality, breadth of treatment, majestic form, and vast scale.

THE LONDON COUNTY COUNCIL.

THE last meeting of the first London County Council was held at Spring-gardens on Tuesday afternoon last, Sir John Lubbock, Chairman, presiding.

The Water Question.—The Chairman said:—Since our last meeting, the Committee appointed by the metropolitan and home county members of Parliament have conferred with the representatives of Birmingham. We were assured that an additional supply for Birmingham was a necessity. Mr. Chamberlain said that to obtain it would require at least eight years, and as prudent men they must look ahead. They would, however, gladly meet us on points of detail. They urged strongly that in the opinion of their engineer there would be a sufficient supply left for London. They courteously, however, consented to postpone the second reading till next Tuesday. I may add that we are informed there is considerable opposition to the Bill in Birmingham itself. The result of this interview was communicated yesterday to a second conference of metropolitan and home county members. Much regret was expressed that any further appropriation of water-bearing areas should be agreed to until the Royal Commission has reported. At the same time, though no resolution was arrived at, there was a general feeling that, if the needs of Birmingham are so urgent, which, of course, would have to be proved to the satisfaction of the Committee on the Bill, and subject to some agreement on details, it would not be reasonable to oppose the second reading. It was hoped, however, that the Bill would not be passed by the Committee unless the urgency was clearly proved. If the Council approve, I should propose to take this course on the second reading.

At a later stage of the sitting of the Council, the Water Committee submitted a special report with the following recommendation:—

"That this Council trusts that Parliament will not pass the Birmingham Corporation Water Bill before the water consumers of the metropolitan area have had an opportunity of putting their own case before the Royal Commission, except on the clearest possible evidence that the urgency of the matter in the case of Birmingham is so great that it must be pushed forward immediately without regard to the requirements of the population of the Thames basin; and the Council hope that, should the Birmingham Bill be referred to a Select Committee, an instruction will be given to the Committee in this sense."

Mr. Lloyd moved, as an amendment,

"That this Council will take every step to prevent the Birmingham Water Bill being passed until the Royal Commission has reported."

After some discussion the amendment was negatived, and the resolution of the Water Committee adopted.

Lauderdale House, Highgate.—The Parks and Open Spaces Committee reported as follows:—

"The Council on the 7th July, 1891, decided to remove the old building in Waterlow Park known as Lauderdale House, but as its removal would to a certain extent spoil the effect of the old terrace and gardens adjacent, we have had prepared a plan showing how the house could be restored, at a cost of 2,250*l*. It is proposed to divide the upper part into sets of rooms to be occupied by the Council's *employés* in the park at a rental of 65*l*., and to let some of the lower rooms for refreshment purposes at a possible rental of 65*l*., retaining others for conveniences for both sexes. We submit the plan referred to, and recommend:—

'That, subject to an estimate being submitted to it by the Finance Committee, as required by the statute, the Council do authorise the Committee to incur an expenditure of 2,250*l* in the restoration and alteration of Lauderdale-house, Waterlow-park, to suit it for the purposes of a refreshment house, conveniences, and residences for workmen employed in the park.'"

This was agreed to without discussion.

The Hackney-Wick and Isle of Dogs Relief Sewer.—The Main Drainage Committee reported that they had considered the tenders referred to them on the 16th ult., for the construction of the Hackney-Wick and Isle of Dogs Relief Sewer. The tenders varied from 31,046*l* 14s. to 53,221*l*., the lowest being that of Messrs. S. & E. Bentley*. The Committee had made inquiries relative to Messrs. Bentley, and as these were satisfactory, they recommended that their tender, amounting to 31,046*l* 14s., be accepted. But the Chairman of the Committee, Mr. Howell Williams, added that since the report and recommendation were printed, Messrs. Bentley had written withdrawing their tender, owing to a serious error made by them, and the Committee therefore recommended that the next lowest tender, that of Messrs. E. & W. Iles, amounting to 36,600*l*., be accepted.

This proposition led to considerable discussion, in the course of which it was suggested by Mr. Acworth and Mr. Beresford Hope that the contractors tendering were collusive. It was explained by Mr. Howell Williams and another member of the Committee, Mr. MacDougall, that there was no ground for such an assertion. The error arose in pricing a large quantity of excavators' work. An amendment was moved to refer the matter back to the Committee, with instructions to re-advertise the works. It was urged against the amendment that the relief sewer in question was urgently needed, and that the tender of Messrs. Iles was well below the amount of the Engineer's estimate for the work. The amendment was defeated by 34 votes against to 15 for it, and the recommendation of the Committee was then agreed to.

The Labourers on the Blackwall Tunnel Works.—On the motion of Mr. Leon, it was resolved:—

"That the Council refuses to consider a lower payment than 6*l*. an hour as a fair rate of wages to be paid to labourers by the contractors for the works of the Blackwall Tunnel, and as complying with the declaration made in their tender that they pay the rate of wages generally accepted as fair in the trade."

Vote of Thanks to the Chairman.—On the motion of Mr. Fardell, seconded by Mr. J. Williams Benn, and supported by Mr. G. W. E. Russell and Mr. Thornton, it was resolved "That the best thanks of the Council be accorded to the Right Hon. Sir John Lubbock, M.P., for his able, courteous, and impartial conduct in the chair."

Sir John Lubbock, in reply, said:—I am, I assure you, very grateful to you for the kind resolution which you have just passed. But I have even more to thank you for the generous and constant support which you have always given me in the chair. I shall leave the Council, in many respects, with much regret and many pleasant memories. We are just now the subject of a good deal of criticism, especially as regards our expenditure; but when the time has come for a calm and impartial judgment, I think it will be said that if we have raised the rate a halfpenny in comparison with that of our predecessors, we have a good deal to show for it. I may refer, not as more important than the heavy, unostentatious, and ever-increasing work of our other committees, but in justification for the rise, to the fact that, in addition to other heavy items, we have completed Rosebery-avenue, begun the Blackwall Tunnel, finished the Northern main drainage works at Barking, and our successors will be able in a few weeks to open those at Crossness. This will do much to purify the Thames. We have also increased the precautions against fire, and we have enlarged and beautified the parks. Three years ago we met with feelings of some suspicion and antagonism, but, while we still differ in opinion, we have

* For full list of tenders see *Builder* for February 20 page 149.

learnt more and more to respect and appreciate one another. We began as opponents, we end as friends; and the reason has been that, however much we may differ about the means, we havebeen united by our desire to promote theprosperity of London, and the comfort, health, and happiness of our fellow-citizens in this great metropolis.

Vote of Thanks to the Staff.—On the motion of Mr. Æneas Smith, it was resolved as follows:—"That the Council desires to place upon record its high appreciation of the services rendered during its term of office by the entire staff of officers, clerks, and workmen, and that this resolution be communicated to the officers at the asylums and out-stations."

A vote of thanks was also passed to Messrs. Beachcroft and Osborn for the assistance they had given to the Chairman since the death of the second Deputy-Chairman of the Council, Mr. Haggis.

The Council then terminated. The election of the new Council, as our readers know, is to take place this Saturday, March 5, and the first meeting of the new Council is fixed for Tuesday, March 15. Some ten or twelve of the old members of the Council have already been re-elected without a contest at the polls; and nine of the Aldermen, who were elected three years ago for six years, will retain their seats on the new Council. The nine Aldermen referred to are Mr. Arthur Arnold, Mr. Frank Debenham, Sir Thomas Farrer, Mr. Frederic Harrison, Lord Hobhouse, Mr. Quintin Hogg, Lord Lingen, Mr. Edmund Routledge, and Mr. G. W. E. Russell.

DEMONSTRATIONS ON GREEK SCULPTURE IN THE BRITISH MUSEUM.

MISS EUGÉNIE SELLERS considered, in her fourth lecture,* the sculptures of the Mausoleum and of the Nereid monument. Greek funeral monuments consisted of single slabs, with the figure of the dead man or woman represented as engaged in some ordinary occupation; but in Asia Minor the funeral monument of a rich prince took the form of an elaborate building, which was in effect a kind of temple, in which stood the statue of the dead man, who was worshipped there with divine honours. Such was the Mausoleum, the funeral monument of Mausolus, of Hali Karnassos, which was built at the beginning of the fourth century. Miss Sellers discussed various theories with regard to its restoration, but said that in the absence of any blocks of the stylobate giving the intercolumniation no final conclusion could be arrived at.

The figure of Mausolus is interesting as being one of the earliest specimens of portraiture. The sculptures of the friezes are interesting. We know from Pliny that Greek masters worked on them. The chariot race is specially remarkable for the flatness of the planes of the relief, and for the excellence of the work, in part of which we can trace the hand of Skopas. Yet for all the beauty of individual slabs, the general effect is decoratively not quite satisfactory, missing as it does both the flow of the Parthenon and the balanced groups of the Phigaleian frieze.

The Nereid monument from Xanthos, also a funeral monument, shows Asiatic work under Greek influences. Of the friezes, that representing a fight, probably of barbarians against barbarians, is the most Greek. The besieged city of the second frieze, with its fortresses, is eminently pictorial, and not at all Greek in character. Another gives us faithful renderings of scenes of daily life.

The composition of the pediments is quite elementary, that representing a battle-scene, which is the more advanced of the two, recalling the symmetrical arrangement of the figures on the pediments of the temple at Ægina.

Miss Sellers ended her lecture by a reference to the far finer work of the frieze of the temple of Nikê.

ART UNION OF LONDON.—The Art Union are issuing to their subscribers Mr. Wyllie's powerful etching of the escape of "H.M.S. *Calliope*," a work well worth popularising. The alternative etching, after a picture by Mr. Dendy Sadler, was not worth doing on the large scale on which it is executed: a constant mistake of the Art Union, which encourages the ignorant to think that half the merit of an engraving consists in its size.

* For brief notes of the previous lectures see *Builder* pp. 141, 164, *ante*.

THE ROYAL COMMISSION ON LABOUR:

BUILDING TRADES EVIDENCE.

SECTION C. of the Royal Commission on Labour' which embraces textile and miscellaneous trades, proceeded to receive evidence concerning the building trades on the 25th and 26th ult. The Right Hon. A. J. Mundella, M.P., Chairman of the Section, presided, the other Commissioners present being the Duke of Devonshire, Sir F. Pollock, Mr. L. Courtney, M.P., Mr. Bolton, M.P., Mr. Burt, M.P., Mr. Tait, Mr. Austin, Mr. Tunstill, and Mr. Livesey. The witnesses were representative men coming from the three kingdoms, and those from Ireland were the first called.

Mr. John Simmonds, Secretary of the Dublin Trades Council, although speaking for trades generally, alluded specifically to a strike in the building trade last June, arising from the refusal of unionists to work with non-unionists; and in reply to very pointed questions he defended this action, on the ground that workmen had a right to join a union if they chose, and to object to non-unionists reaping the benefits obtained by efforts in which they had not assisted. In this instance the union used no unusual means; they first requested the employer to induce the non-unionists to join the organisation, and on his declining to interfere, they gave a month's notice. They informed the employer that they could not work with the other men, whereupon he sent a circular to other employers urging them not to employ unionists. In another instance a dispute in the carpentering trade was amicably settled after a month's duration, and in the bricklaying and building trades a six weeks' dispute was terminated by the intervention of the architects of Dublin and some other gentlemen. As a rule, strikes were few in Dublin, and his Council were strongly in favour of the creation of a Board of Conciliation. Dealing with other points, this witness stated that some members of his Council were also in favour of taxing labour-saving machinery, seeing that the introduction of machinery had greatly injured manual labour, and had driven men into the workhouse. He did not say that in his own trade planks ought to be sawn with the old saws in a pit, but at the same time there was more employment under that system than there now was. He did not wish to convey that machinery ought to be abolished.

The Chairman: But you suggest the taxation of it, which is worse.

Witness: Humanity is taxed, and what takes the place of humanity ought to bear a portion of the taxation.

The Chairman: It assists humanity; it does not tax them.

Mr. P. Lynskey, representating the Amalgamated Carpenters' and Joiners' Society of Dublin, which contained about 1,100 members, said that at present there was a good understanding between employers and employed, but he agreed with the previous witness as to the right of unionists to object to non-unionists. At the same time he also approved of having a Board of Conciliation. In the instance given by Mr. Simmonds, the Society first approached the other men, who then said they would join the Union, but they failed to do so, and that caused the Union men to strike.

The Chairman: Do you think that a proper thing to do?

Witness: I do. The unionists are the men who fight, and who obtain all the reforms; and the non-unionists, who take no part whatever in the struggle, receive all the advantages which the unionists have gained. Witness added that in this case the employer got men over from Scotland, and then issued a black-list to prevent the men who had struck from earning their living in Dublin. The non-unionists were not driven to starvation because they were struck against, because there were certain "jerry-shops" in Dublin where they could get work, at rates lower than the standard rate. He did not think that that course was injuring the trade, for in Dublin the first-class shops all employed unionists, and the best men were unionists. The inferior shops never got a fair class of workmen. Prior to 1890 the working hours were 60¾ per week, but they were now 54, and he believed the carpenters were satisfied with that period. But he advocated the legislative abolition, to some extent, of overtime, and with regard to the eight-hours' question, he thought that such a system should be international, so that English workmen should not suffer from the competition of other countries where the hours were unrestricted. The introduction of machinery had displaced about 10 per cent. of the men in his Society. A great many carpenters had left Dublin during the last few years through the adoption of machinery worked by men who were not carpenters. In moulding they would do in ten minutes what men would require two days for to do by hand. He would, therefore, tax that machinery, to pay for the up-keep of the men displaced. He also advocated greater facilities for giving technical and manual instruction.

Mr. R. S. MacNamara, Chairman of the United Building Trades Society of Cork, which includes carpenters, masons, stone-cutters, and plasterers, and numbers about 1,000 men and boys, explained that there were something like 1,500 hands in those four trades, of whom 600 were unionists, 150 non-unionists, 200 apprentices, and 500 unskilled labourers. The general minimum rate of wages was 5s. a day of ten hours, the working hours being sixty a week. The relations between the masters and the men were, on the whole, amicable, and the present rate of wages and working hours had been in operation for twenty years; but the trades had given notice for a reduction of an hour a day from May 1. Personally, he should favour a Board of Conciliation for the building trades, but not for all general industries. When work was abundant the unionists had no objection to non-unionists working with them, but otherwise they did object, and, in fact, they had struck against non-unionists. Mentioning that the Government paid a lower rate of wages than private firms, the witness recommended the appointment of a responsible Minister who should acquire information on all subjects upon which disputes were likely to arise between capital and labour, and that if possible a State Board of Arbitration should be formed, of which such a Minister would have charge. As to machinery, its introduction would, of course, at first displace a considerable number of men, but ultimately it would, he thought, benefit the workmen. This witness also considered that overtime should be abolished, and with respect to the suggestion of an international agreement as to working hours, such agreement would have to be made, not only by all foreign nations, but by the United States and some of our colonies.

Mr. J. H. Jolly, representing the Trades' Council of Cork, having also been examined, the Irish evidence was for the time closed. English evidence was opened by the examination of

Mr. Arthur Otley, General Secretary of the National Association of British Plasterers, who, in the course of his testimony, said his trade had had a great many disputes in recent years, and the chief cause had been the system of sub-contracts. Upon this theme he entered at some length, and not without warmth. Under this system builders sublet their work to "piece-masters" or "task-masters," who contracted for labour only. They were men who had no reputation to lose. They took the work at a low figure, but, as the builders knew, they could not properly carry it out. In illustration of this subject, he mentioned an instance which occurred at the Birmingham Post-office, where the whole of the plastering work was sublet in this way, and as no other work gave such opportunities for inferior material and for adulteration, in this case there was adulteration to the extent of 50 per cent. Again, a similar case took place in connexion with the Imperial Institute, a contract being sublet to a man who was well known as one of the greatest "scampers" in London. Against this man the members of the Association struck, knowing that the work was not being done as it ought to be done, and as the result of a deputation to the Committee the Association were ultimately assured that for the future the work should not be sublet. When they found that work which should take two days was being done in one day, they considered it their business to see about it.

The Chairman observing, "You struck work because the work was not lasting long enough?" witness replied that that was not their reason. They struck against the method, because the system was injuring the trade. The men were working at the usual rate of pay and of hours. The point being put to him whether this was not a matter for the clerk of the works, Mr. Otley asserted that the work was being "scamped," and on the question whether there was not the architect to redress their grievance, he replied that when he considered how architects were sometimes connected with building he felt that it was quite impossible to get any redress from them. He explained this by reference to cases where architects and surveyors had started building, and observed that under these circumstances it was useless to appeal to them. The strike lasted eight weeks, and in the end the contractors put in a fair foreman, and the work had been better done. A similar experience occurred in connexion with the "New Scotland Yard" buildings, and the man complained of was dismissed after representations had been made to the Home Secretary. The witness next described certain strikes which had taken place in regard to wages, and expressed himself as strongly in favour of a Board of Conciliation.

Mr. George Dew, Secretary of the London Building Trades Committee, was the next witness, and he strongly confirmed the views of the preceding witness respecting sub-letting. Being asked to explain this, he said the practice meant that the same amount of work was squeezed out of four men which in the ordinary way would require five men. In order to do that a man must adopt various methods of slovenly work. The work was pushed on in such an interior manner that it was not only bad for the men but for the people for whom the work was being done. This applied to every class of building,—the evil prevailed in all the branches. The Council endeavoured to deal with the evil by inducing public authorities to insert in their contracts a clause prohibiting this practice. For this purpose they had appointed a special Committee, and the first body with whom

they were successful was the London School Board. It was well known that some of the schools were falling to pieces, and in consequence costing the Board a large sum of money. This kind of work had become unbearable, and at last the workmen, who were being prejudiced by being hurried and forced, determined to submit to the system no longer. Accordingly, in 1888, the Council convened a conference of the various branches to consider what could be done, and the first result was a deputation to the First Commissioner of Works to induce him to insert a prohibitory clause in the Government contracts to prevent subletting, and to ensure the payment of the wages recognised in the trade. They adopted the same plan with the School Board, and had succeeded in securing a clause, not only forbidding this sub-letting, and providing for the payment of the recognised wages, but that the rates to be paid shall be attached to the contract. Moreover, they had gone a little further with the London County Council in this matter, and had secured the insertion of a clause providing for the rate of wages and also for the working hours, and also a penalty of 500*l.* for sub-letting a contract. So far the penalty had not been enforced. With the Government they had not succeeded quite so well. Three years ago the contract for repairs and maintenance of all public buildings in the metropolis was in the hands of Messrs. Brass & Son, at a low rate of wages, viz., 1½d. per hour less than the trade-union rate. By this all union men were shut out from Government work. The contract was, in fact, let on distinctly sweating lines. The Government simply issued a schedule asking contractors for their tender of rates. The rate in the schedule would be 9½d. an hour; and the contractors would be asked what rebate they would make and how much they would return as discount. This schedule was issued every three years, and each time the contract was retaken there was, generally, a larger amount of discount, and this became so bad that when, three years ago, Messrs. Brass took it, 16½ per cent. was struck off. Therefore they could only pay 7½d. per hour when they ought to have paid 9d. Under these circumstances the Building Trade Committee made a representation to the Government, and ultimately got a resolution proposed in the House of Commons on February 13, 1891, on the subject. They first proposed, through Mr. Sydney Buxton, that in all Government contracts a clause should be inserted "requiring that the contractor shall, under penalty, observe the recognised customs and conditions as to rates of wages and working hours that prevail in each particular trade; and that the contractor should, under penalty, be prohibited from sub-letting any portion of his contract, except where the department concerned specially allows the sub-letting of such special portions of the work as would not be produced or carried out by the contractor in the ordinary course of his business." Mr. Plunket, First Commissioner of Works, after considerable debate on the motion, stated that the Government were in favour of the proposal, but they were not able to accept the wording of the resolution, and proposed instead the following:—

"That, in the opinion of this House, it is the duty of the Government in all Government contracts to make provision against the evils recently disclosed before the Sweating Committee, to insert such conditions as may prevent the abuse arising from sub-letting, and to make every effort to secure the payment of such wages as are generally accepted as current in each trade for competent workmen."

That was agreed to by the House unanimously, but it was not all they wanted. The question of hours was not included in the resolution, but if that were done they would be satisfied. They did not want the Government to fix the hours, but simply to recognise in their contracts the hours agreed to between employers and employed. Good as that resolution was, and determined as the House seemed to be to make the condition of the men better, still the Government had broken faith with them. In a schedule of wages presented to him by Mr. Plunket as to the rate to be paid in London, carpenters were to have 9d. an hour, and men of extra skill 1d. more. Masons and painters, and other men, were to have the same, but soon after the contract was signed the rate for painters was put at 8½d. to 9d. But after that rate had been accepted by Messrs. Holland & Hannen, to whom the contract was let, they reduced the rate to 7½d. A long correspondence had been going on between the Trade Committee and the Office of Works, and a compromise had now been effected, under which another ½d. was to be given, and the minimum was fixed at 8d. On the question of hours, Mr. Dew expressed himself as in favour of eight hours; that was to say, that the Government should legislate for a general eight hours, but that it should then be by trade option, because some trades might want it and others not. If the Government would only insert the hours clause in their contracts, that would have a great and good effect on the workmen throughout the country. Their resolution was, in fact, as much in favour of the contractors as of the men, or even more so, because it would tend to put a stop to the present cut-throat system. Mr. Dew's next point was that, as the building trade was carried on at great risk, principally from scaffolds falling, the Employers' Liability Act ought to be amended. At present a contractor was allowed to insure himself out of his liability for accidents. A great deal of plant was used by builders, and it should be of the very best quality; but, if an employer could make an arrangement with an insurance company, it would be cheaper to do that than to spend more money on good plant. That was dangerous to the men, and the practice was ruining the trade, for the contractor, knowing he was insured whatever happened, did not care. Therefore, he wanted the Act altered to make the employer personally responsible.

The Duke of Devonshire: How can you prevent him from insuring?

Witness: Well, you might make it a penal offence.

The Chairman: You might say you would prevent a shipowner from insuring his ships?

Witness: Yes; I think it would be a good thing for the sailors, for I believe a great many lives are lost through insuring. The witness further urged that there should be a better system of inspecting builders' works,—not the premises being built, but the shops where the materials were being prepared. A large amount of machinery was employed, and accidents frequently occurred, for proper precautions were not taken to fence round the machinery,—the sawing machinery, for instance. Persons of all ages were employed on the machinery, and, in fact, two-thirds of the men and boys so employed had lost fingers. He had never seen an inspector going through these shops, and he knew no one who had; but he considered that as much care should be taken in those shops as in factories. Reverting to the strike at the Imperial Institute, he stated that all means possible were taken to settle it. In fact, they always tried to settle disputes amicably with the employers, by conference and conciliation, and it was never the fault of the workmen if they did not succeed. In this case they first asked the Commissioners of the Institute to interfere with the contractor, and to hold an investigation. They replied that they had no right to interfere between the contractor and his workmen, and refused to do so. The Committee, after the strike had lasted some time, again asked them to do so, but without success; and then, as a last resource, he got a petition signed by all the workmen and presented it to the Prince of Wales, asking him to intervene. How it came about he did not know, but the men were then successful, for the obnoxious man was removed, and the foreman was put back in his place. Stating, in answer to the Chairman, that he was not at present prepared to reply to questions respecting strikes in his trade in the last six months, and that that had better be left for another occasion, Mr. Dew gave some examples of discount being allowed to the Government. He observed that the *status* and character of the workmen were better maintained when they dealt directly with the contractor, and insisted that the middleman ought to be abolished, for the middleman caused scamped work, and that cast reflections on the men themselves. Speaking again with regard to hours, he said he would regulate that according to districts and towns. He would let London decide for itself, and then let every other large town do the same. He was not in favour of a universal eight hours, but of the proposal in the "Fabian Bill," which provided that, while an eight-hours' Bill should be passed by the Legislature, then any trade might by a two-thirds majority of votes come within the provisions of the Act. With that the masters had nothing to do; for, if the eight-hours' limit was adopted all round alike in each town or district, it would not matter to them. He again urged that if employers knew they had no insurance to fall back upon, they would be more careful, and there would be fewer accidents; but on this point he admitted that there might be a strong case for allowing mine-owners to insure, though he would allow no other exception. Finally, he mentioned that the wages under the Government three years' contracts had been raised by from 25 to 30 per cent., and that had made a great difference as to the character and efficiency of the men employed. The best class of men did not work under the old system, because the union would not allow them to do so.

Mr. G. J. Davies, of Manchester, formerly Chairman of the Amalgamated Society of Carpenters and Joiners, and Mr. F. Chandler, General Secretary of the same body, were examined together. The latter stated that the Society was formed in 1860, and that in that year there were 680 members, with an income of 321*l.*; but in 1870 the number had risen to 10,178, and their assets to 17,568*l.* In 1880 there were 17,764 members, with assets 46,395*l.*; and in 1890 there were 30,693 ordinary members and 803 trade sections, with assets 66,359*l.* Having described the objects of the Society, he said the wages varied in different localities. In London the rate was 9d. an hour; in Manchester, Liverpool, and Birmingham it was 8½d.; in Leeds, Sheffield, Leicester, and Derby it was 8d. Speaking generally, the rate in the North and in the Midlands was 8½d.; it was somewhat lower in the South of England, and lower again in the West. The working hours in London were 51½ in the summer and 47 in the winter; and in Manchester they were 52 in summer and 47 in winter. Referring to the strike in London, he stated that it lasted seven months. The strike was for increased pay and reduced hours, and in the end, as the result of arbitration, the men resumed work on the old scale of pay,—9d. an hour, but with a slight reduction in the hours per week. Thus practically the men in London had got fifty hours a week and 9d. an hour. The joint committees of masters and men had worked together excellently. Mentioning that the branches of the Society extended not only throughout the United Kingdom, but to some of our colonies, and to the United States, he said a great many members went to America, where they joined existing, or opened new, lodges; but owing to the relative cheapness of living in this country he thought the men were quite as well off at home as those who went to the States. With respect to the question of insurance, he admitted that the Employers' Liability Act was fairly effective, but he considered that employers ought to be made personally responsible. Insurance took away any motive for protecting the men; if employers were able to shift their responsibility on to the insurance companies, then the whole object and spirit of the Act would be defeated. Therefore, he would alter the Act so as to bring them under the common law. Mr. Davies took a similar view on this question, and held that insurance by employers ought to be abolished, for it made them careless as to their plant and as to the safety of the men. With better organisation the conditions of trade had greatly improved, and the relations between masters and men had likewise improved. The Society's working rules had always provided for masters and men meeting (six on each side) to arrange disputes, and they had generally come to an amicable understanding without having to resort to arbitration. Alluding to the Labour Bureau of the Board of Trade, he acknowledged that the information it had supplied on trade questions had been very valuable, so far as it went, but he wished to see the organisation improved, in order that the workmen should have as much information about the employers as the latter had respecting the employed.

Mr. W. Knox, Secretary of the National Association of Master Builders, Liverpool, described the existing state of affairs in the building trades in that city. Correcting Mr. Chandler by stating that the wages in Liverpool were 8d., and not 8½d. an hour, he stated that the relations between the masters and the men were amicable, and experience showed that good organisation on both sides led to good feeling. They found the best workmen among the unionists, but when engaging men they did not ask them whether they were unionists or not, and they kept no black lists. Extra pay was given for overtime, and compensation was given for accidents. Labour-saving machinery was introduced whenever and wherever practicable. He was of opinion that sub-contracting worked well and harmlessly, and he denied that insurance against risks made the employers careless as to the men's safety. There had long been a system of arbitration in Liverpool in case of disputes, and it had never failed but once, viz., in 1890, when the men refused to abide by the decision of the arbitrator. A strike ensued, and lasted six months, when the matter was again referred to arbitration, and the men accepted what the employers had at first offered them. The masters had a system of mutual insurance, but they wished to see a system established jointly between the masters and the men, for they found that more money was often spent in litigation than was eventually paid as compensation. The London strike had lost the men 200,000*l.* in wages, and, after all, they had to accept the masters' original offer; but if there had been a Board of Arbitration in London, such as there was in Liverpool, he believed the dispute would have been settled without a strike.

Scotch evidence being next taken,

Mr. J. Beveridge, of Glasgow, Secretary of the Associated Carpenters and Joiners of Scotland, stated that the Society was established in 1861, and in that year the members numbered only about 500, but it now had a membership of 5,795, out of a total of 7,000 unionists in these trades. The witness having mentioned that the Society had fifteen branches in England and two in Ireland, he was invited to account for the singular circumstance, as it appeared to the Commissioners, that an essentially Scotch association had English and Irish offshoots, especially as there was a very strong Amalgamated Society of Carpenters and Joiners in England. This he did by explaining that they were instituted mainly for the convenience of members who left Scotland in search of work. The English branches were mainly composed of Scotchmen, but still there was a fair number of English members, while the two Irish branches, in Belfast and Londonderry, were composed chiefly of Irishmen. In the next place he stated that wages varied in Scotland according to locality. In Glasgow the rate was 8½d. an hour, but in Aberdeen and Inverness it was 6½d., and he partly accounted for this extent of variation by the fact that wages were generally highest where the trades were well organised. Aberdeen, he said, was very much behind Glasgow and other large towns in regard to wages. But while there was that inequality in wages, they had equality in working hours in Scotland, and employment was fairly regular, except in the winter. A good deal of machinery was used, and there was no hostility to it on the part of the men. The trade unions were generally recognised by the employers, and

the unions claimed the right to refuse to work with non-unionists. Upon this point the witness was somewhat closely pressed by the Commissioners.

The Chairman: Do you think that a wise and sound policy?

Witness: We think it is only through the unions that a number of advantages have been derived, and the non-unionists would reap the same benefits. They would get the same wages.

Do you think that is consistent with perfect freedom and individual liberty?

Witness: The employers have the same right as ourselves.

Then you think there is nothing wrong in the employers making black lists?

No.

Then you think employers are perfectly justified in putting a mark against certain men and circulating their names through the trade to prevent their obtaining employment, because they may be leading members of a trades union?

I maintain that the employers have the same right as the workmen have. We have no black list.

If you say it is a sound policy that a non-unionist may be struck against wherever he goes, how can you complain of employers for doing the same?

We do not complain. Non-unionists are sometimes as good as unionists.

Is it not hard for them to have to contend against the unionists?

It is equally hard for the unionists to have to contend against them. The contention is the other way: if a man is not connected with us in a dispute he is against us.

The witness further said that the relations between the employers and the employed were generally amicable, and there were very few strikes in Scotland. Some of their branches had Boards of Conciliation, and generally he was in favour of that method. In Glasgow there was a sub-committee of the men appointed to meet a sub-committee of masters, who only met on special occasions. Regular fixed meetings would, he thought, be better, and would tend to the disappearance of disputes. During the last ten years the Society had spent 4,109*l.*; but as the organisation had improved, the relations with the employers had been better and the strikes fewer. They were anxious to settle disputes peacefully.

Mr. J. Brough, secretary of the Glasgow Branch of the Operative Masons' Society, followed, and after giving details respecting the membership, he mentioned that the wages in 1860 were 4½d. an hour, but they rose gradually until 1877, when they stood as high as 10d. In the following year, however, they fell away to as low as 6d., and this he attributed mainly to the failure of the Glasgow Bank, which put a stop to the building trade. By last year, however, the rate had risen to 8d. He described the relations between masters and men as good, and expressed himself in favour of an eight hours legal day, but admitted that it might not be right for him to insist upon other trades only working a certain time because he chose to do so, and said he had no objection to the use of machinery, if it was not employed longer than the manual labour.

This Section has now adjourned for a fortnight. When it meets again further building trade witnesses will be called.

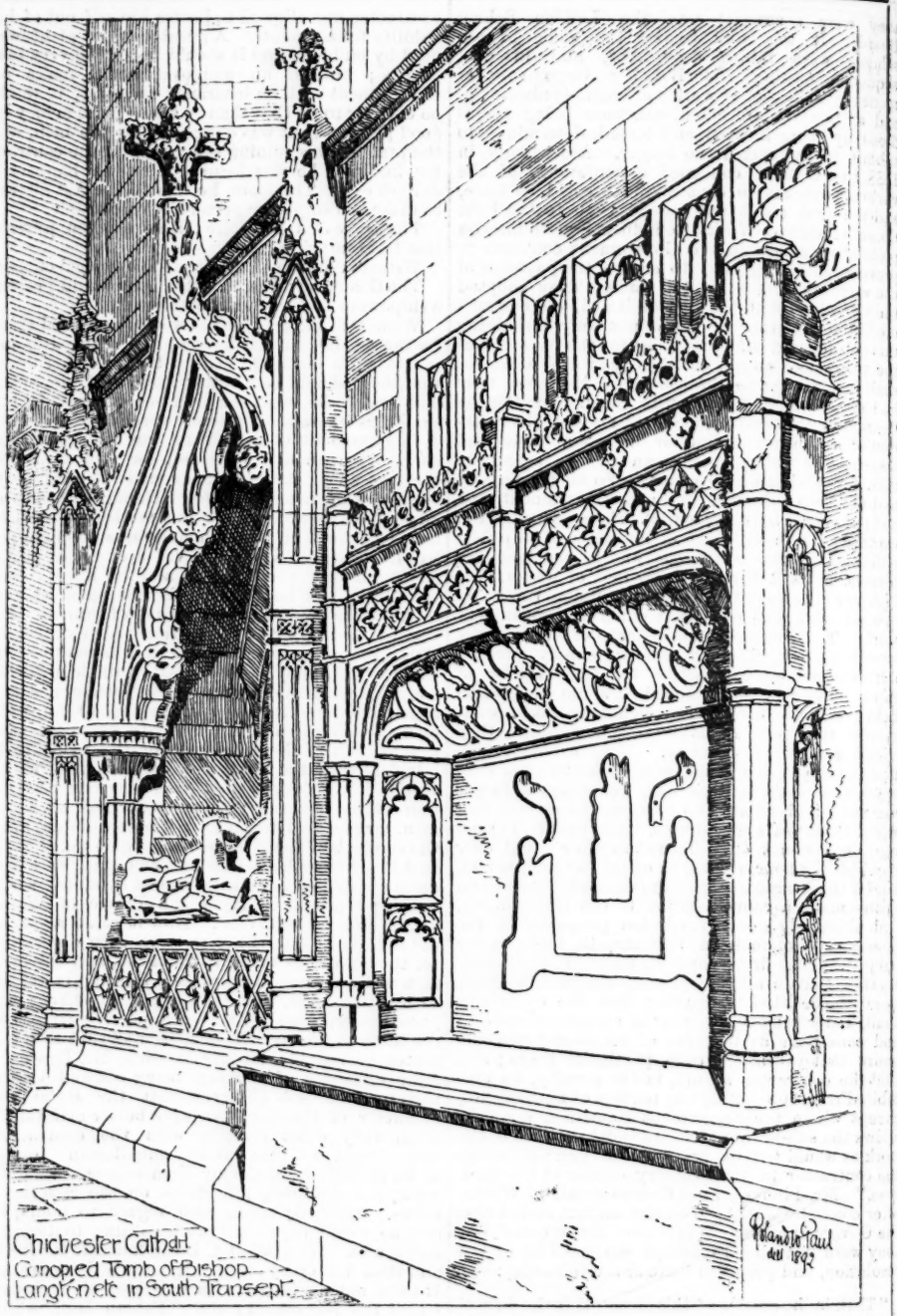
"THE BUILDER" ALBUM OF ROYAL ACADEMY DRAWINGS.

WE hope that those architects who are sending drawings to the Royal Academy will assist us to keep up this collection of illustrations of Royal Academy Architecture annually, in the same manner in which it was commenced in 1891, by lending us for publication whatever drawings they have for exhibition for this year's Royal Academy.

Every contributor of a drawing which is exhibited at the Royal Academy is presented with a copy of the Album, containing all the Royal Academy drawings of the year that have been published in this journal.

Architectural drawings have to be delivered at the Academy on March 25, 26, and 28. All drawings sent to the office of the *Builder* for illustration will be duly delivered at the Royal Academy by the publisher of the *Builder*, and removed and returned to their owners at the close of the Exhibition. It is, of course, understood that such drawings should not appear in any other publication.

We must also especially draw attention to the necessity for sending all such drawings duly provided with the descriptive labels required by the Royal Academy. We cannot undertake the responsibility of writing and affixing the required labels, which must rest with the owners of the drawings.



Illustrations.

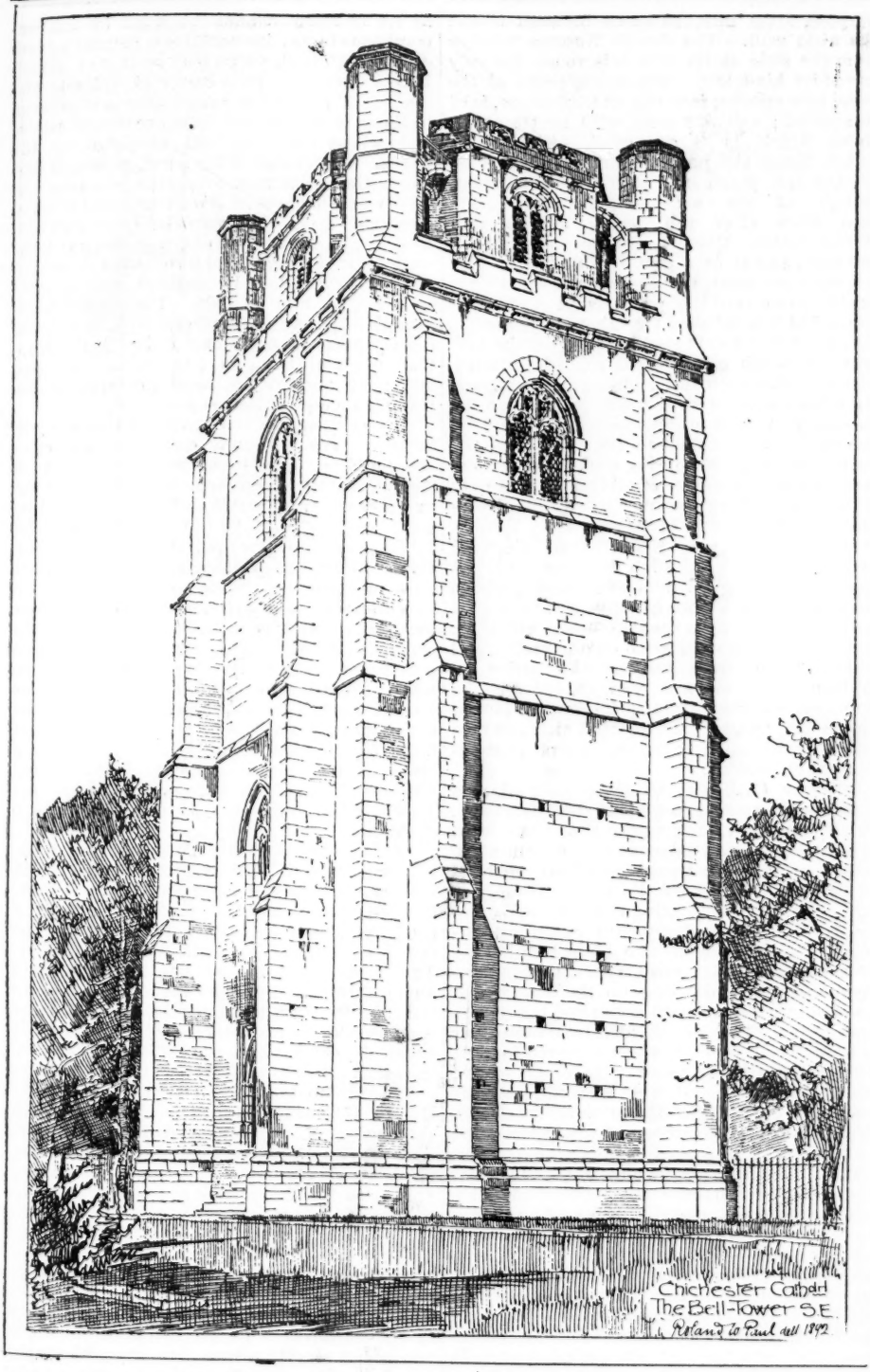
CHICHESTER CATHEDRAL.*

"CHICHESTER has received a heavy blow, and England a warning," are the words with which this journal announced the fall of the central tower and spire of the Cathedral in the *Builder* of March 2, 1861, and the most instructive record of the great collapse is told in full by an eye-witness in the ensuing article. To the visitor of to-day, whether architect or layman, the chief interest of the place lies in the story of the fall, and a thrilling and almost tragical tone, quite unusual in the literature of Cathedral buildings, pervades the description referred to. In spite of the advice of eminent architects in consultation, aided by an experienced civil engineer and three contractors, with all the forces that they could bring to bear, the beautiful tower and spire that had stood for 600 years, with slow deliberation akin to stateliness, descended into the body of the church, and laid itself in a conical heap. The mystery is not yet solved how it came to pass that what had stood for so many centuries, in the year 1861, after some months of warning and preparation, collapsed, in defiance of all that modern skill could effect.

The history of most English Cathedrals is interspersed with fires and falls; but they are mostly remote from our time, and do not come home to our minds with any vividness; but one cannot avoid the remark that such catastrophes in the Middle Ages were made the occasions of greater elaboration and beauty in the re-erected structure, as we shall see was the case at Chichester in the twelfth century, while in our time the greatest architectural authorities that could be brought to bear upon such a situation only considered the opportunity as one for imitating with accuracy all that had been done in the earlier ages, and in one modern work have reproduced the rough-hacked stonework of the Norman imposts and shafts and the delicate traceries of Decorated diapering. Surely the fall and reconstruction of Chichester tower and spire should have tragic reflections for architects in this age of light and progress!

Following the method adopted by the late Professor Willis in his "Architectural History of Chichester Cathedral," the plan that is now published indicates four periods of its constructive history. Generally speaking, the Cathedral was as complete when first erected in Norman times as it is to-day, and the work of the subsequent builders was confined to rebuilding portions of the Norman church on differing lines, and in throwing out a series of chapels from each aisle of the nave, and in extending the Lady Chapel. The four periods are: 1. Norman. 2. Works consequent on the fire of 1186. 3. Addition of chapels on the south side of the nave. 4. Similar additions on the north side, and some other works. These divisions correspond roughly with the eleventh to the twelfth, the twelfth to the thirteenth, thirteenth and early fourteenth, and fourteenth and fifteenth centuries respectively. The building internally is a Norman frame, clothed with an early thirteenth-century dress, with more fully-developed accessories,

* This series of illustrations of the Cathedrals of England and Wales was begun in our issue of January 3, 1891. A list of those already illustrated, with particulars of future arrangements, will be found on page xxii.



and throughout there is no breach or want of harmony in the Mediæval work. The See of the South Saxons was founded at Selsey ("Seals Island"), a few miles distant, by St. Wilfrid, and removed to Chichester after the Conquest, in 1082, in accordance with the Conqueror's decree, that the Bishops were to be located in the larger towns by Stigand, who was William's chaplain. Two curious carved slabs fo Our Lord raising Lazarus and of His meeting with Mary and Martha, now in the choir, of Saxon workmanship, are said to have been brought from Selsey. Gosfried succeeded Stigand, and of his penance for some unknown default, and absolution by the Pope, a small leaden sepulchral cross, preserved in the Cathedral, tells; and he was followed by Radulph, 1091-1123, the founder of the Cathedral building. Under this Bishop the whole of the Norman work which we now see was executed.

His plan was cruciform with the four great Norman arches of the crossing, whose *facsimiles* exist, carrying a low Norman tower, the presbytery eastwards terminating in a large apse and ambulatory; two circular chapels and a prolonged square Lady-chapel opened from the ambulatory. The foundation of the apse exists below the paving of the present presbytery, and the commencement of the radiating wall can be clearly seen in the masonry of the easternmost bay of the choir aisle from the cloister garden. The position of the Norman external triforium window, not over the centre of the square wall below, but to the westward at this point, also clearly points to the diminishing bays which radiated around the apse. Three of the five bays of the Lady-chapel are of Norman walling, and it will be, therefore, seen that the original Cathedral of Radulph extended nearly as far east as the present one. The transepts were without aisles, but each had an apsidal chapel on its eastern side of the diameter of the arches now existing in the transepts. That on the north side can be traced in the springing of circular masonry from the wall in the chamber over the now altered chapel below. The nave consisted, as now, of eight bays, four consistent in style with the work of the choir and the four western bays differing slightly in detail and dimensions (see lithograph "View across Nave"). These may not have been erected until after a fire which occurred in 1114, during the same episcopate, of which we are informed by Malmesbury, who states that Henry I. principally assisted in repairing the damage. This difference in the dates of the nave shows that the eastern portion of the church was built first. The ground story, triforium, and clearstory of the Norman church remain, altered only on the face presented to the nave. The triforium is large, and lighted by small windows in the external walls. The side aisles are similarly intact, the outer wall and windows only having been altered. These were vaulted, though vaulting was not contemplated for the nave, which, undoubtedly, had the usual ceiling and low wooden roof. Two western towers and a connecting front completed the church, though there is no evidence that this work was finished. The two lower stories of the existing southern tower are Norman.

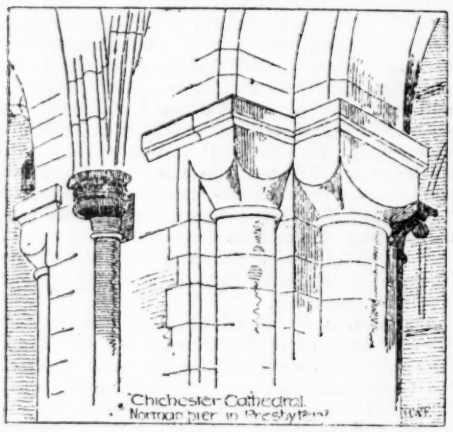
This completes the account of Bishop Radulph's work,—a singularly great achievement, as his building, unlike most others, remains of sufficient dignity and elasticity to serve the purposes of subsequent ages. His character and work were as remarkable as his church. He withstood William Rufus manfully in Anselm's defence, and distributed the whole of his estate to the poor. The tomb in the Lady Chapel in the western bay of the north wall, marked "Radulfus Epi," has a special interest as probably being the modest resting-place of one of the group of great building Bishops of the Norman epoch, who created so many of our English Cathedrals.

The second period of architectural activity does not open until after the great fire of 1186, in the episcopate of Siegfried, formerly Dean of the Cathedral, who was Bishop from 1180 till 1204, and fourth after Radulph. This fire involved the greater part of the city as well as the church, and the Bishop energetically divided his rebuilding benefactions equally between both. The roofs and fittings of the Cathedral were completely destroyed, and the walls consequently damaged in the upper ground stories by the burning and falling timbers. The mischief, however, to the walls was only superficial, and the Norman construction, perhaps with the exception of the apse, remained intact. Siegfried refaced the lower story below the imposts of the piers throughout the nave with Caen stone, and rebuilt the inner face and arcade of the clearstory. The new Early English spirit in architecture was now beginning to glow throughout the land. St. Hugh of Lincoln came to his see in the year of the Chichester fire. Thomas à Becket had been martyred at Canterbury twelve years before, and four years before Chichester suffered the Cathedral of Canterbury was destroyed by fire, and already was beginning to arise from its ruins as the most beautiful shrine in England, rich with the offerings of pilgrims to the martyr's tomb. But Chichester and Siegfried had no wonder-working saint. St. Richard of Chichester was scarcely born, as he was not consecrated Bishop until 1245 (he died 1253 and was canonised 1261), and no very extensive or costly alterations could be made to suit the new taste. But the skill of the Bishop's architect enclosed the Norman arches with a face of delicate English moulding in place of the large rude roll, and carried it upon slender Purbeck shafts with gracefully-carved capitals instead of upon the heavy semi-round Norman ones. To the side aisles these earlier and ruder features remain now for comparison.

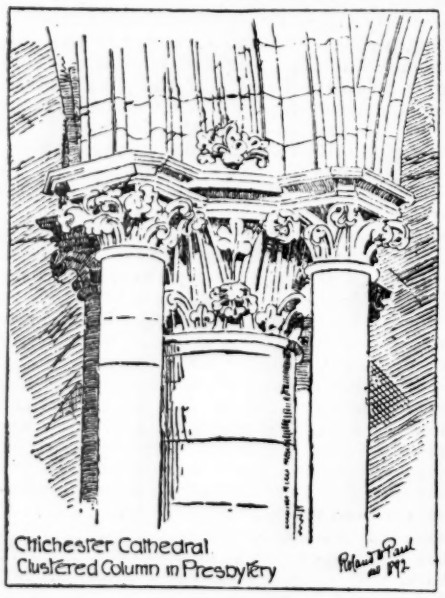
Moulded Purbeck strings were inserted above and below the triforium throughout, and the new clearstory arcade had shafts and caps of similar material. The whole Cathedral, nave and aisles, was then re-roofed with a simple and elegant quadripartite vault supported on delicate triple shafts with foliaged capitals carved in Purbeck.

The pointed arch first appears in the new vault in juxtaposition with the Norman work, Siegfried having retained in his reserved outer arches of the ground story the older form. The whole of this work was most carefully bonded into the walls, and its present condition testifies to the constructive as well as artistic skill of its architect. Limited as the Bishop evidently was in means, his simple economy in the body of the church enabled him to accomplish notable work in the retro-choir, which he built upon the site of Radulph's embryo chevet Whether the arches and columns of the apse became unsafe on losing the support of the abutting roofs during the fire, or whether they were purposely removed, does not appear, but probably the former supposition is correct. Siegfried, being in sympathy with the new national life that was being expressed in buildings throughout the country, departs from the French type, and plans a square-ended choir with two square chapels to take the place of Radulph's circular ones, but preserves the Norman square lady-chapel beyond. Thus the area of the Cathedral was not extended, but its character altered by a bold stroke from Norman to English, and though, even in the new work, Siegfried retained the circular form for the enclosing arches, which mark his work as, after all, transitional it is the product, not of the Norman conquerors or their descendants, but of a fresh spring of art in the life of the new English people. The retro-choir or presby-

ery is a work of singular beauty of design and detail; the proportions, though low, are suited to the circular arches employed, and there is a



breadth of treatment and display of wall-surface, especially in the design of the east wall, that most satisfactorily closes the Cathedral vista, and yet opens it into the lady-chapel without the weakness of result or awkwardness of expedient that exists to mind in so many



other cases. The general height and spacing of the adjoining earlier work was retained, but the strings above and below the triforium were stepped up to provide increased height for the wider arches and mouldings of the ground story. The piers are of singular and beautiful design, each member of the Purbeck cluster of shafts manifestly doing its own work around the central column, which is also of marble. The capitals are fully carved with rich trefoil leafage, and are proportioned in depth to the varying diameter of their shafts. The abacuses are varied, some round and some square, in each story. The triforium of the east wall is very fully decorated with the best type of Early carving,—strong, virile, small figures,—Our Lord in majesty in the centre spandrel, with angels on each side in the tympanums of the adjoining arches, with clusters and bands of interesting foliage, clear and simple in form, and so justly recessed that it is far more effective from the floor of the church than from any nearer position. The arches of the clear-story arcade are all pointed; in the nave only the centre one was pointed, the supporting side arches being round. The vault is continuous with the new one to the nave and choir. The work of this period includes the rebuilding of the transept chapels, thus removing the remaining apsidal terminations from the plan. Adjoining the north transept a large double chapel was built, elegantly vaulted from a central marble-shaft. After doing duty for centuries as a parish church, these chapels are now used as the chapter library, a circular stair gives access to a large upper chamber, in the wall of which are to be seen the springing stones of the former Norman apse. In this room now repose extensive remains of the fifteenth-century wooden reredos. The chapel in the south transept was simply re-designed by Siegfried, and a chamber, either for watching friars or some subsidiary purpose, fitted into the space between it and the aisle wall. The double Norman window from the aisle exists into this room, the only one of its kind left. The south porch of the nave, now opening into the later cloisters, is of this period; a double arch with centre shaft, above which is a quatrefoil niche for a figure, forms the porch. The sacristy, which adjoins the porch and the south transept, though of the same style, must have been built after the porch, as the wall of the latter, though obviously lengthened and used, and is of a greater thickness. This is a fine apartment, and is vaulted. This room would have served the purposes of a chapter-house, but it is believed that though the site is lost, there was a detached building for the purpose. A porch on the north side of the nave, with a double arch and centre column supporting a tympanum with a trefoil niche, and the necessary addition of buttresses everywhere for the new vaults, complete the records of the Second Period. Excepting the sacristy, there seems to be no doubt that all these works were carried out by Siegfried, and the rebuilt Cathedral was dedicated in 1199 to the Holy Trinity. It was in this year that Bishop Siegfried assisted at the coronation of King John. A special chronological interest is thus given to the Early-English work at Chichester included in this description, as the date of the fire, 1086, and that of the dedication are recorded, and within the comparatively narrow period of thirteen years we are able to observe the genuinely national style springing into power, and as yet treating the pointed arch not as a matter of necessity, or the round arch as something to be avoided.

With the Cathedral so far completed, the scope of the two remaining periods is narrowed, and it can easily be imagined that if no local saint had attracted pilgrims and canonisation to his remains there would have been no need for further extension of the plan. The Third Period, however, embracing the thirteenth and the opening of the fourteenth centuries, witnessed the erection of two chapels adjoining the south aisle of the nave, each occupying two bays in length, and filling up the unoccupied space between the south porch and the south-west tower. They are divided from each other by a cross-wall, which has been removed in post-Reformation times. The eastern of these two chapels was dedicated to St. Clement, and the western to St. George. The south aisle wall was pierced by four wide arches of the period, and a width and effect gained in the Cathedral nave that was soon to be emulated on the other side. Large windows were provided with gables over them, and the ridge of the vault was tilted up in order to include a larger window area. The similarity and the slight development of the style shows that no great period had elapsed since the last link had been added to the architectural chain. A small chapel in the easternmost available bay of the north aisle was built at this period, and dedicated to St. Thomas; it contains a very beautiful and perfect stone reredos arcade and adjuncts. There are traces in the southern chapels of such reredoses, but in its present condition the northern one is quite unique.

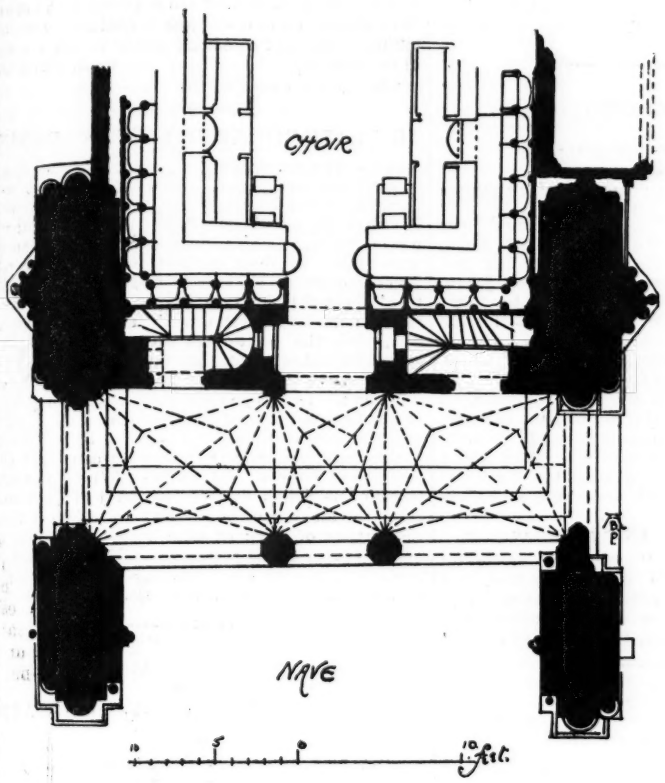
To this period we must assign the central tower that lasted until thirty years ago; the spire to the succeeding period; the battlements and turrets are not original. The rose window in the east gable of the choir, which is of graceful geometrical design, belongs to the Third Period; also the upper story of the south-west tower. The earliest works of the Fourth period are the two remaining chapels of the north aisle, which very exactly correspond with the earlier ones on the south side. They were, however, only separated from each other by a screen-wall. These two groups of chapels give, with the nave and aisles, such width to Chichester, that it is difficult to realise that it is second only to York among English Cathedrals, the former being 90 ft. and the latter a little over 100 ft. across the nave. Very picturesque and sombre effects of light and shade and of grouped arches give interest to what is quite a small interior in general appearance The Lady-chapel was lengthened by the addition of two bays, and the same character given to the three Norman bays. This was executed by Bishop Gilbert de Sancto Leofardo, 1288—1304. For purity and beauty of detail this work can be considered as one of the best examples of the early fourteenth century. The western Galilee porch of the nave is of about the same period, but the date of its erection cannot be fixed by contemporaneous facts; its contains a founder's tomb on its south wall, which may be that of Bishop Berghestede, the predecessor of Gilbert, who died in 1287, and was buried after a pilgrimage to Rome to be absolved from excommunication, and whose authority was obtained for the works. The design of the porch is simple and large, the mouldings and piers marking the steady development of the Geometrical into the Decorated style. The very fine Decorated window in the south transept, with the adjoining wall, buttresses, gable, and rose window, are the work of Bishop John de Langton, and recorded as given by him in 1308. The great window occupies the whole southern wall, and immediately below its south-east corner is the canopied tomb of Langton (see illustration, page 186); he was Chancellor of England, as was also his successor, Robert Stratford.

The parapets to the nave are Decorated in period. The unusually crooked character of the building, in spite of its homogeneity of design, made their treatment a matter for the exercise of considerable skill. The difficulties have been overcome by the use of two corbel tables, one over the other, the varying projection of the corbels making the parapet straight without drawing attention to the way in which it is effected. The spire, with its solid dormers and octagonal pinnacles, was added to the central tower in the fifteenth century; the proportions are distinctly elegant, and the ornament refined and well concentrated. The traceried bands around the spire emphasise the satisfactory diminution of the spire, which is of a somewhat wide angle of 13 deg. Fergusson remarks that this is similar to Lichfield, and with it differs from Salisbury, Norwich, and Louth, which are only 10 deg., and far too slender.

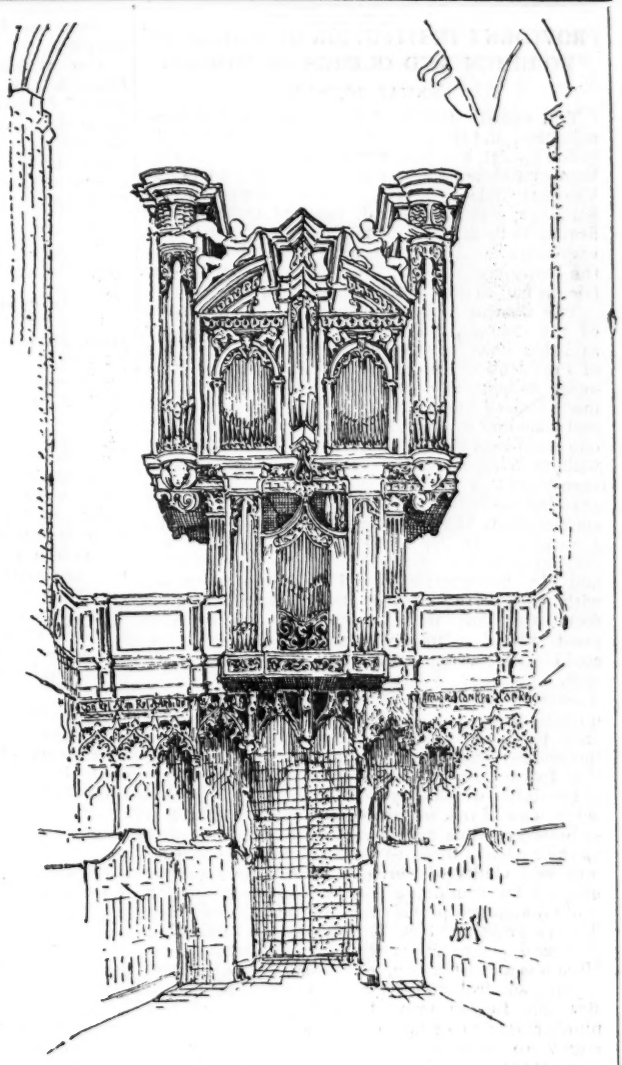
Passing on to Early Perpendicular work, a large window was inserted in the north transept to emulate Langton's on the south, but was much more clumsily carried out, a great flying buttress being necessary to save the upper portion of the north wall from falling. The settlements caused by this window are apparent now. An upper story was added to the sacristy with two buttresses. This room was used as a consistory court, and from it access is obtained to a vaulted treasury over the south porch by a secret door in the panelling.

The episcopate of Sherborne of New College, Oxford, 1508-1536, was a time of much gain to the Cathedral. There existed until a short time previous to the fall of the central tower in 1861 a very beautiful stone rood-screen, known as the Arundel Shrine, containing two shrines within a graceful and richly-vaulted arcade of Early Perpendicular work, behind the eastern wall of which were staircases giving access to the rood, and in later times to the organ, as shown in the sketch. Most of the decorative details of this screen are preserved in the north-west tower. Within the choir Sherborne erected a complete range of simple but beautiful stalls under a canopy arcade returning at the back of the rood-screen. A fine reredos and similar screen work was also erected by him, and he provided some most interesting painted decorations, by employing an Italian, named Theodore Bernardi, some of which remain on the vaulting of the Lady Chapel, and in the screens of kings and bishops portraits that lined the south transept walls. A drawing of Bishop Sherborne's tomb, by Mr. R. W. Paul, will be found among the lithographs in the present number.

The cloisters, which lie around the south transept as a centre, instead of against the south aisle of the nave, as more usual, are Perpendicular, with a simple arched wooden rafter roof; the detail is interesting, and the enclosing wall of the three sides is probably of very varying dates, and its irregular shape indicates that it formed the boundaries of buildings to which the cloisters lead, rather than that it was laid out on the usual plan. In the south-east corner, the cloister passes under the west end of St. Faith's Chapel, the gable of which stands upon the angle and adjoining bay of the east walk. An archway at this point opens into an interesting Vicar's close, one side of which only remains, with the ancient hall adjoining St. Faith's. The Bishop's Palace occupies the corresponding angle of the precinct. The massive detached campanile to the north-west of the Cathedral is of Late Perpendicular style (see sketch, page 187), and appears by its breadth and low proportions to have been designed for the purpose of emphasis-

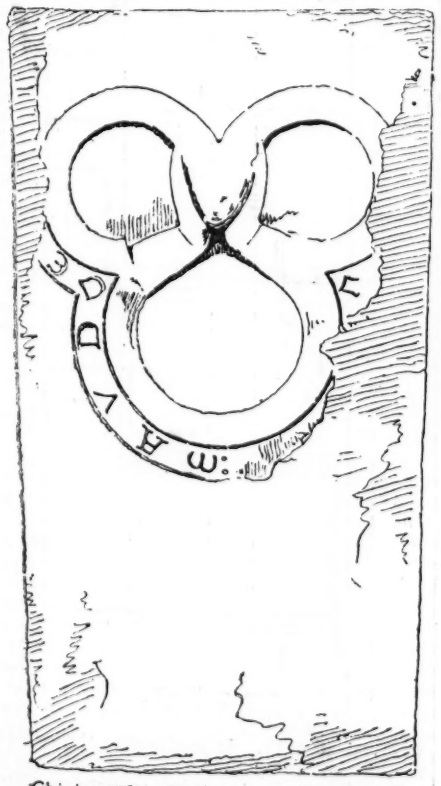


Plan of Ancient Rood Screen at Chichester Cathedral, between the tower piers, called the "Arundel Shrine," and the return stalls of the choir. Drawn by Mr. Beresford Pite.



Sketch from old Drawing, showing Organ-case and Return Stalls, Chichester Cathedral, before the fall of the tower. Drawn by Mr. Beresford Pite.

ing the gracefulness of the ancient central spire. There is a Renaissance monument to Bishop Sherborne in the south choir aisle, maintained by his former college. In the



Parliamentary wars Chichester was stormed by Waller, whose men damaged the monuments and organ. Sir Christopher Wren rebuilt the upper portion of the central spire, and devised a heavy pendulum within it of timber to preserve its centre of gravity under wind pressure. Nothing, however, since the completion in the thirteenth century can be compared in importance to the works preceding the fall of the tower in our time. The stonework walls of the Arundel Shrine, with the return stalls and handsome organ, were removed to throw open the nave for services with the choir, and shortly after the fall took place, destroying shrine, stalls, and organ, though the damage resulting to the rest of the building was comparatively slight. Sir Gilbert Scott rebuilt the tower, with its supports, and added 6 ft. to its height. Old prints exist, and a view was published in the *Builder* of March 2, 1861, showing the old proportions, which were, perhaps, not improved upon. A very large masonry reredos was erected in the presbytery by the late Mr. Slater, and Messrs. Bodley and Garner have recently finished a large and delicate oak choir-screen. The comfortable proportions and effect of the old choir will not, however, be regained until Bishop Sherborne's oak reredos and the return stalls are restored to connect what are now but two detached ranges of stalls and canopies, and complete the interest of a very satisfactory interior.

A. B. P.

VIEW ACROSS THE NAVE, CHICHESTER CATHEDRAL.

THE view has been taken from the south aisle looking north-east, showing a portion of the chapels beyond, which were thrown out in Decorated times. The large mass of the nave piers, however, makes a good view of the whole width of the church difficult to obtain.

R. W. PAUL.

BISHOP SHERBORNE'S TOMB, CHICHESTER CATHEDRAL.

THIS is the best-preserved tomb in the Cathedral, and the most elaborate in design. It is of alabaster, with a good deal of colour. This and the head of the effigy have been restored, and the monument is kept in repair by New College, Oxford. The heraldic charges on the shields of the tomb itself have been painted in a very indifferent manner. Those on the shield at the back of the tomb are better, and are carved in relief. A curious part of the design is the raking of the jambs of the canopy, the little turrets which flank it being, however, upright. On the front of the tomb is the following marginal inscription:—

NON MIHI SED IVDICIVM CVM SERVO TVO DOMINE

Robert Sherburne

The tomb was made during the Bishop's lifetime, and is an effective piece of work, bearing strong evidence of Renaissance feeling. Sherborne's stalls still exist, and the remains of painted screens are in the transept. The fragments of his reredos, of wood, are lying at present in the room over the library.

R. W. PAUL.

DETAILS OF SARACENIC ORNAMENT.

THESE formed some of the diagrams illustrating Professor Aitchison's sixth and last Royal Academy Lecture on Saracenic Architecture, printed in full in this number. They are chiefly illustrations of the geometric ornament of the Saracens, to which is added an example of floral ornament executed in tiles.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS:

ANNUAL DINNER.

THE annual dinner of the donors, subscribers, members, and friends of this old-established Institution (which has just attained its Jubilee, having been established January 31, 1842) was held in the Venetian Saloon of the Holborn Restaurant on Saturday, Feb. 27, Mr. J. Howard Colls (of the firm of Colls & Sons) in the chair, supported by a very large number of the members and friends of the Institution,—so large, indeed, that some of the friends had to dine in adjacent rooms.

The Chairman, in proposing the principal toast of the evening, "Prosperity to the Institution," said that when he was asked to accept the position of President of the Institution he accepted it at once, without any hesitation, having previously made himself acquainted with the good work that it had done and was continuing to do year by year. No one could read the annual reports of the Institution without being convinced of its value and importance to a large section of the building trade. Before entering upon his position as President he had spoken about it to the respected Governor of the Institution, Mr. George Plucknett, whom he was very glad to see present with them that evening, and Mr. Plucknett said: "I have been connected with the Institution for thirty years, and I feel sure that it is doing and has done a great work." Higher testimony than that he could not have. As they all knew very well, builders' foremen and clerks of works were very often associated together,—not always quite so happily as on the present occasion,—and they were all the better for the opportunities of intercourse which they had through the medium of that Institution. The importance and responsibility of the duties which they fulfilled in their respective callings could not be over-estimated by architects or builders. The architects and builders, as well as their clients, owed a very great deal to the foremen and clerks of works, who were to be commended for combining together in an effort for mutual help and providence. But he confessed that it was a great mystery to him why the Institution possessed, comparatively speaking, so few members. Here was an Institution, excellent in its aims and objects, admirably managed, and possessed of considerable funded property, and yet it did not number nearly so many members on its roll as it ought to have, considering the number of men there must be who were fully qualified to join the Institution. The advantages of the Institution to those whom it was designed to benefit could not be questioned. To quote a few words from the annual report for 1891, "the advantages of the Institution begin to show our colleagues the advisability of joining and putting their shoulders to the wheel while young to help to build up a provision for themselves, their widows, and orphans. Eighteen new members have joined during the year, being the largest number for several years. This is very gratifying to the Directors; but, at the same time, they would urge on all our members the necessity of caution in introducing new candidates, so that everyone that joins may be a credit to the Institution." Those were admirable words, and he trusted that one result of that gathering would be a substantial accession of new and worthy members. With the toast he proposed, he had very great pleasure in coupling the name of Mr. Bedford, one of the secretaries.

The toast was heartily received, and Mr. Bedford, in reply, expressed his gratification at the fact that no fewer than 363 friends of the Institution were present to testify to their interest in it.

Mr. G. Groome, in an amusing speech, proposed "The Governor, Trustees, Donors, Subscribers, and Visitors," coupled with the name of the Governor, Mr. George Plucknett. This toast was also very heartily received.

Mr. Plucknett, in replying, reviewed the work of the Institution, but expressed regret that it had only eighty-eight members, while there ought to be hundreds, if not thousands.

Mr. J. Mowlem Burt, in proposing "The Architects, Engineers, and Surveyors," coupled with the name of Mr. H. Percy Monckton, F.R.I.B.A., referred to the responsibilities which devolved upon architects, engineers, and builders in the carrying out of buildings. They could not afford to work for only eight hours a day, or even for only ten hours; their responsibilities and anxieties could not be dropped in a moment, as they could be by the workman when he "downed tools."

Mr. Monckton replied, and referred in highly appreciative terms to the work of a good foreman and a good clerk of works.

Mr. J. Adams proposed "The Builders," coupled with the name of Mr. John Mowlem Burt, who, in reply, again referred to the anxieties of builders, especially with regard to accidents and the Employers' Liability Act. Builders found that, do what they might in the way of providing proper plant, appliances, scaffolding, &c., many workmen appeared to have no thought whatever for their own lives and limbs, nor any care for those of their fellow workmen. The result was that accidents were of frequent occurrence, and these led to vexatious actions for damages against the employers,—actions too frequently prompted by unprincipled lawyers.

The remaining toasts were "The Chairman" (proposed by Mr. J. W. H. Bedford), and "The Press" (proposed by the Chairman, and coupled with the name of the representative of the *Builder*).

During the evening, subscriptions and donations to the amount of about 110*l.* were announced by the secretary.

Correspondence.

To the Editor of THE BUILDER.

CONCRETE FOR ARTISANS' DWELLINGS.

SIR,—I cannot see why "Surveyor" should be so anxious to avoid iron joists, for they are cheap enough. I am writing far from price-lists and formulæ, but I think that two rolled-iron joists, 10in. in depth, dividing each room into three moderate sized bays, would cost about 5*l.* for the two. Against this "extra" there would be, of course, an "omission" of concrete, by reason of the layer having to span, say, 4 ft. instead of 12 ft.

The iron joists would tie the walls together,—a very necessary precaution, if there be none of wood,—and the centreing for the concrete could be hung from them instead of being strutted. They would also help to form a scaffolding until the floors are put in,—an operation which should not be undertaken until the roof is on.

ANOTHER SURVEYOR.

P.S.—Why does not "Surveyor" make an experiment or two with different spans and thicknesses of whatever concrete he proposes to use? It would be a very simple matter, and, spite of all printed testimony, "seeing is believing."

"INSULA."

SIR,—In the articles referring to the excavations in process at Silchester, which appeared recently in the *Builder*, I noticed frequent reference to the various "insulæ" that had been laid bare in the course of the excavations. I understand that the term "insula" applies to the square blocks of ground, bounded by roads or streets on all four sides, and covered by houses and shops and their courtyards and gardens. Perhaps some of your archæological correspondents will oblige by informing me if the term "insula" so applied was used by the Roman dwellers in Silchester and other Romano-British cities; or if, on the contrary, "insula" is only a term used by modern archæologists to describe these separate blocks of buildings.

My reason for asking the question is as follows:—In Ayr we have a narrow street or lane bounded on both sides by the oldest buildings in the town, and this lane, while its official or directory title is "Hope-street," has been known from time immemorial, and is colloquially spoken of to-day by most of the inhabitants as "The Back o' the Isle." This lane lies at the back of a square block (insula?) in the very centre of the town, lying like an island in the middle of the High-street. The High-street passes on the east front of this island block, and is 50 ft. wide. The "Back o' the Isle" is on the west front of the island block, and averages 15 ft. in width.

Now, supposing the term "insula" was an old Romano-British term for such a building stance,* would it be too liberal a deduction from the facts to argue that this present island block in the High-street of Ayr occupies the site of an "insula" of the old Roman township, which probably existed on the site in old Roman occupation times, and that the local "phrase-title" is a reminiscence of the old Roman days, although its origin had been long ago forgotten and lost sight of? I should perhaps have mentioned that the Roman road through the western lowlands of Scotland passed through Ayr.

If, on the other hand, the term "insula" is nothing more than a modern archæological term, it is at least interesting that the same term, or a variation of it, should have been in use in Ayr for very many years past.

JAS. KENNEDY HUNTER.

Ayr, February, 1892.

* "Stance," we are informed, is a Scottish term for a building lot.—ED.

ARCHITECTURAL CASINGS FOR ELECTRIC WIRES.

SIR,—I notice in your report of the discussion upon Mr. Max. Clarke's paper at the Architectural Association, that Mr. R. Langton Cole considered my moulded casings excellent, but thought it curious that the covers were all screwed in the centre, although I quoted, in the preface of my book, the "Phœnix" rule that all covers should be screwed at the sides. Will you kindly allow me to explain to architects that neither the Phœnix, nor any other company, makes it a *sine quâ non* that the covers shall be screwed at the sides; but simply recommends that this should be done where possible. In point of fact, so far as the majority of small-sized casings are concerned, there would be a considerably greater risk of the screws damaging the insulation of the electric wires, if such screws were inserted at the sides than if they were driven in the centre of the covers. In my book, where the width of the casing allows, I invariably indicate screws at the sides. I think any architect will see at a glance that the fillet between the grooves in all my designs is sufficiently wide to minimise any risk attending the insertion of screws in the centre. F. A. FAWKES.

Chelmsford, February 27.

THE LATE STRIKE STILL SMOULDERING.

SIR,—The carpenters and joiners do not appear to have got over the autumn's strike. Last week upwards of one hundred men had a shop meeting in one of the best-known firms in London (four men out of five had attained to grey hairs and "specs.," presumably in their service), and passed a resolution requesting the firm to discharge two "blacklegs" forthwith, because they acted differently to them in an important crisis. The reply virtually was, that the petitioners were quite as black as their two mates; that they would not be paid off at their dictation, even if all of them left their employment. I trust you will record this to the credit of the firm and Master Builders' Association, whose ordinary course in similar cases is to discharge men.

This occurred in my experience when I was shop foreman of joiners. I then kept for my own satisfaction the prime cost of the work of each man. After the men's requests were acceded to, I found the output of work of each man declined on the average three shillings per week. When firms are confronted in such emergencies, let them compute on this average for profit and loss. BENCH.

The Student's Column.

WARMING BUILDINGS BY HOT WATER.

X.

EXAMPLE WORKS (HORTICULTURAL) (*continued*).

THIS next example, fig. 36, introduces a new feature, viz., the "main" pipes, which are nearly always necessary when the houses exceed two. These mains fulfil the purpose of conveying the heated water to the different branches, and returning the cooler water to the boiler after it has done its

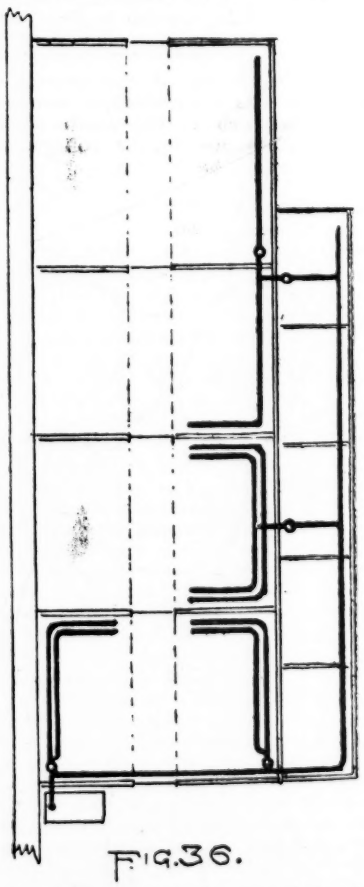


FIG. 36.

work, so to speak. In some cases the mains do nothing but this; that is to say, the pipes are not used for radiating purposes, but are entirely covered up. In the example now treated the mains are made use of for radiating purposes as well, for it will be seen that after coming along the end of the first house they proceed direct along in front, passing through a range of melon pits which are heated by this means.

(These pits are commonly used for melons hence the name; other things are often grown in them, of course.)

These pits are generally kept at a little lower level than the houses, and this enables the proper rise to be given to the branches as they pass into the houses. In this case, the mains would be kept below the ground-level where they pass along the side of the first house. They could be run in a channel with grating over, or be quite covered up.

It will be noticed that the particular value and need of the main flow and return is to permit of the simple yet exact regulation of the heat in the different houses independently of one another. In the illustration it will be seen that every branch from the main has a stop-cock at the point indicated by a small circle, and it will be equally obvious that by this arrangement the circulation can be adjusted to any house with the greatest ease, and almost instantaneously. This means of independent regulation, as explained in the last paper, is very necessary, for not only may there be too much pipe in a house, but sometimes, for reasons often hard to account for, one branch will work more freely than another and to the detriment of others, and has to be checked. If these four houses were heated by continuing the pipes from one to another, as in the example given last week, regulation would be next to impossible. If we attempted to check the circulation in, say, the second house, we could not do so without seriously affecting the third and fourth houses. It might be mentioned that another reason for having a stop-valve in each branch of the example being treated (fig. 36) is that it is no uncommon occurrence for one branch to work to almost the entire exclusion of the others, to "short-circuit," we may say. There are various reasons for this, and the subject will be touched upon in later papers.

When an apparatus extends a good distance in one direction, it is particularly desirable to get the boiler as low as possible so as to give a fair rise to the mains the whole of their length. The mains would only consist of two pipes, one flow and one return. To obtain this rise necessitates rather a deep boiler-pit, and this is arranged for if it is possible. In many situations when digging a pit, water is met with inconveniently near the surface, and for the pit to be taken down below this point means expense in the first place, and the risk of its being but a poor success afterwards. There are now many boilers made expressly for "shallow drainage," as the difficulty is called, and if by using these dwarfed boilers there is no occasion to go below the water-level, then it is best to adopt this course. Instead of there being the risk of water finding its way into the pit, there should always be a drainage to the pit itself. If the "shallow drainage" difficulty is known to exist, there are many remedies that can be, and are, resorted to, when building the houses. The person who erects horticultural buildings knows, of course, that they have to be heated, and should make all proper and possible preparation.

Again, referring to the "mains," it is sometimes thought best to carry them up the centre of the houses in a channel or trench. The houses then get the benefit of the heat from these as well as the branches, and allowance has to be made accordingly when calculating the quantity of pipe required. It will, however, be found that pipes in channels are not of such value in heat-giving as exposed pipes. When mains are carried in this way through the houses the rise they require necessitates their being started rather low down, and the channel would need to be deep at the commencement if all the houses were on a level. If the houses are on slightly rising ground it proves very satisfactory in many ways, supposing the boiler can be placed at the lowest end.

Carrying the pipes in this latter manner within an open channel, probably with grating over, is not considered so satisfactory as covering them. In the first place, exposed mains generally result in the end houses of a long run being poorly supplied with heat; then the expense is a little greater if gratings are used. If we cover up the mains in a satisfactory manner no loss of heat occurs, the branches are well supplied, and there is not the trouble of keeping the channels clean. In this case it is understood that the main pipes do not enter into the calculations as to the quantity of radiating pipe required. They take no active part beyond supplying the branches.

In carrying the mains beneath the ground in covered channels, they can either pass under the houses or beneath the ground just outside them. In either case it is customary to make a brick trench, allowing the proper rise required, and the pipes are laid in this. It will not do, though, to leave the pipes without filling in the trench around them, and the best material for this purpose is sand. When the pipes are thus surrounded with this poor heat-conducting material the channel is covered with bricks or slates and the earth filled in. If desired fillets of wood can be placed beneath the pipes to lift them a little, and so allow the sand to completely envelope them. Fig. 37 shows in cross

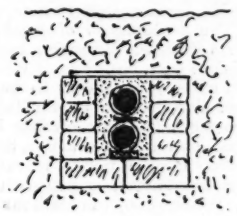


FIG. 37.

section the pipes as they lie in this covered trench. If the channel was unfilled and there was any possible chance of air entering it, we should get an action resembling in some ways the draught in a chimney, that is to say, the air near the pipes would become heated and would rise; at the same moment cold air would flow in, a continuous current would result, and the in-flowing cold air would rob the apparatus of heat at a very rapid rate and to no good purpose whatever.

Sand is the best material to surround these pipes with to prevent loss of heat. Sawdust or hair would answer well, except that it would not withstand moisture so well as tightly-packed sand, and moisture may be expected with tolerable certainty if the channel is not beneath the house. Silicate cotton is also an excellent material, but for this purpose it would be unnecessarily expensive, and give but little, if any, better results than sand.

The last question to be discussed respecting the main services is as to their size. There used to be a prevailing idea that the mains should be of a sectional area equal to the area of all the branches. When there were many branches this led to really enormous pipes being used, the bulk of water they contained necessitating some extra power at the boiler. They occupied much room, and the cost was a very disagreeable element.

This plan soon fell into disuse when it was discovered that there was no necessity for such relative areas. Theoretically it carried weight, but in practice results proved it to be unnecessary. For the example under discussion, 4-in. mains will do very well. It is found that this size is quite enough to permit of the water circulating freely, and if we get a moderately-rapid circulation to carry the heated water to the branches, and convey the cooled water back to the boiler, it will be found sufficient. A very rapid circulation is not so much needed, as the water does not lose its heat from the pipes instantaneously, and in this apparatus, although there are four houses, the distance is not great. In a larger apparatus than this, having a greater number of branches, or in instances where the branches are more extensive but the mains limited in length, it may be considered best to use 6-in. pipes for the mains. This is one of the points it is difficult to decide except by actual experience, but it may be assumed that the necessity for 6-in. mains is not very common.

LIVERPOOL ENGINEERING SOCIETY.—The ninth ordinary meeting of this Society for the present session was held at the Royal Institution, Colquitt-street, on the 24th ult., Mr. John T. Wood, President, in the chair. The evening was devoted to the adjourned discussion upon a paper read by Mr. Thomas Morris, F.G.S., at the previous meeting, entitled "Engineers' Tests of Iron Considered, and Suggestions for Standard Uniform Tests." Mr. Thomas L. Miller, Assoc.M.Inst.C.E. opened the discussion at some length, and dealt principally with the contraction of area test. Messrs. Joseph Price, J. J. Potts, Robert E. Johnston, C. H. Darbishire, Prof. H. S. Hele-Shaw, and others, took part in the discussion, upon the conclusion of which Mr. Morris replied. A vote of thanks was accorded by acclamation to Mr. Morris for his interesting and practical paper.

OBITUARY.

SIR JOHN COODE.—The *Times* announces the death of the eminent engineer, Sir John Coode, K.C.M.G., which took place on Wednesday, at Brighton, after a long illness. Sir John, who was born in 1816, was a son of the late Mr. Charles Coode, of Bodmin. He was educated at the Grammar School of his native town, and early in life chose the profession of civil engineer, in which he soon distinguished himself. He began his career under the eminent engineer Rendel, and for a short time was employed on the Great Western Railway. As early as 1847 he was appointed resident engineer at Portland harbour and breakwater, and, on the death of Rendel, engineer-in-chief in 1856. He continued in charge until the completion of this great work in 1872, when he was knighted. He was for many years consulted by the Board of Trade and other Government departments on matters connected with harbours, docks, rivers, and drainage. Many important works were carried out from his designs, including the great breakwater and docks at Cape Town, the breakwater at Colombo, the improvement of the river Bar, in Ireland, the harbours of the Isle of Man, and similar works elsewhere. He was a member of the Royal Commission on Harbours of Refuge in 1858-59, and of the Royal Commission on Metropolitan Sewage Discharge, 1882-83. The harbour of refuge now in progress at Peterhead, and the new harbour works at Dover, for which the Act was obtained last session, are from the designs of himself and his firm. He was President of the Institution of Civil Engineers in the years 1889 and 1890.

GENERAL BUILDING NEWS.

BOARD SCHOOLS, WEST HARTLEPOOL.—The School Board have decided to build upper grade schools, adjoining the Oxford-street schools, which were built two or three years ago for 630 children. They have accordingly instructed the architect,—Mr. J. P. Pritchett, of Darlington,—to prepare a design and carry out the erection of an upper grade school for about 500 children on land adjoining.

WESLEYAN CHAPEL, WEST AUCKLAND.—On the 24th ult., Mr. Joseph Albert Pease, of Snow Hall, Darlington, laid the memorial-stone of the West Auckland Wesleyan chapel, schools, and vestries. These comprise a chapel to seat 250 adults, Sunday-school for 350 children, infant-school, minister's vestry, large class-room, &c. The new buildings are to be constructed of stone, in the Early English style of Gothic architecture, with internal fittings in pitch-pine. The entrance doors of chapel and school are arranged to swing both ways in case of a panic arising. The work will be carried out from designs and under the superintendence of the architect, Mr. J. W. Taylor, Newcastle.

RE-OPENING OF NORMACOT CHURCH, STAFFORDSHIRE.—On the 25th ult., the Bishop of Lichfield re-opened, after restoration, the Church of the Holy Evangelists, Normacot, Longton, and dedicated the new aisle and vestry. Nearly twelve months ago, instructions were given to Mr. John Lewis, architect, of Newcastle-under-Lyme, to form a north aisle to the church. The various works in connexion with this were entrusted to Messrs. H. & R. Inskip, of Longton. According to the *Birmingham Gazette*, the initial design of the church is by the late Sir Gilbert Scott, the building being constructed of red sandstone. The new portion, although not exactly similar, is in unison with the south aisle, and is constructed of Alton stone. The principal rafters are of deal, the plaster work between being executed in adamant. The columns are of brown Wall Grange stone to match the existing ones. The floor of the porch is laid with Hopton Wood polished stone. The aisle floors are laid with tiles from the Campbell Tile Company. The heating arrangements have been carried out by Messrs. Hartley, of Macclesfield. The total cost will be about 1,600*l.*

NEW CHURCH, WEST BROMWICH.—On the 1st inst. the foundation-stone of a new church, which is being erected in the Beeches-road, West Bromwich, was laid by Alderman Farley. The church is to accommodate 350 people. It will be built in the Gothic style, and will consist of nave (52 ft. by 25 ft.), and a chancel with a transept on one side and a vestry on the other. It is intended at some future time to erect a permanent church in front of this, which will then be converted into a parochial room. Messrs. Henry Smith & Son, of West Bromwich, are the builders, and Messrs. Wood & Kendrick the architects.

SESSIONS COURT, GREAT WITLEY, WORCESTER.—On the 24th ult. the new police-court at Great Witley, which has been erected by direction of the Worcestershire County Council, was opened for public purposes. The building is of red brick with Bath stone dressings. The Sessions Court is 33 ft. long by 20 ft. wide, and there are three entrances, one from the magistrates' retiring-room, one for officials, and a larger door for the general public. A room is placed near the public entrance as a witnesses' waiting-room, and there are other conveniences, a porch being erected over the main entrance. The floor of the court-room is of wood

blocks. The ceiling is partly open, and panelled, the frame-work being of pitch-pine, stained and varnished. Tobin's shafts have been introduced, with extra ventilators in the roof. The court is heated with hot-water apparatus supplied by Messrs. Ward & Sons, Worcester. The architect was Mr. Rowe and the contractor was Mr. T. Vale, of Stourport.

NEW POST-OFFICE, GOOLE.—On the 27th ult., the new arcade and Post-office, which occupies a position at the juncture of Aire-street and North-street, Goole, was opened. The arcade connects those thoroughfares with Victoria-street. The main front consists of rooms for the accommodation of the Post-office officials. The arcade, with light iron roof covered with glass, contains sixteen shops on the ground floor, varying in size from 27 ft. by 15 ft. to 17 ft. by 15 ft. An illuminated turret striking clock has been fixed near the Victoria-street entrance, and is the work of Messrs. Wm. Potts & Sons, of Leeds. Mr. H. B. Thorp, of Goole, was the architect.

PROPOSED NEW HOTEL, BELFAST.—According to the *Belfast News Letter*, the Belfast Central Hotel Company intend to erect a new hotel in Belfast. On the ground floor there will be a dining-hall, capable of dining over 200 persons; also billiard-room, smoking-room, and all other necessary accommodation. On the first floor there will be dining, drawing, music, writing, and ladies' coffee rooms, and a number of private sitting apartments. The hotel will contain between 200 and 300 bedrooms. There will be a large number of rooms of various sizes, which will be specially designed for stock-rooms. It is at present intended that the entire building will be lighted with electric light, and it will be fitted up with lifts for passengers and luggage. Mr. Samuel Stevenson, C.E., is the architect.

RE-OPENING OF EPISCOPAL CHURCH, PORTOBELLO.—On the 27th ult. St. Mark's Episcopal Church, Portobello, near Edinburgh, was re-opened after undergoing alterations and additions. The principal change which has been effected in the building is the erection of a chancel, but the whole interior has been altered, the side galleries having been removed and the sittings re-arranged. The ceiling has been panelled, and the church has been painted and decorated. The new chancel is 25 ft. long and 27 ft. wide, with an organ-chamber beyond, shut off by an oak screen. The floor is laid in marble and tiles, and rises in five marble steps to the sacrarium. The altar-table, of carved oak, stands on a marble footpiece a step higher. The credence table is of polished alabaster. Carved stone corbels support the springing of chancel arch. A parapet of dressed stone, with polished brass rail, marks off the chancel. The architects are Messrs. Hay & Henderson, Edinburgh.

BANK BUILDINGS, OLDHAM.—New bank buildings have just been erected in Union-street, Oldham, for the Oldham Joint-Stock Bank, Limited. Entrance is gained from Union-street through two vestibules. The banking-room,—50 ft. square by 26 ft. high,—is lined with faïence tiling, with mosaic floor. The general rooms for management of the bank are placed up to Union-street. The basement has been utilised for bullion and strong rooms, connected with the banking-room by a hydraulic lift. The upper portion of the site facing Queen-street has been utilised as chambers, which have a separate entrance. The building throughout is fireproof. The exterior of the block is faced with ashlar and moulded stonework. The following firms have been engaged upon the building:—Messrs. C. Spencer Bros., Oldham, excavating; Mr. Whitworth Whittaker, Oldham, brickwork; Mr. Thomas Dunkerly, Oldham, masonry; executors of Mr. E. Whittaker, Oldham, general joiners' work; Messrs. S. Ashton & Sons, Oldham, slating, plumbing, and glazing; Mr. James Hall, Oldham, plastering; Burmantofts Works, Leeds, faience work and fireplaces; Messrs. Pattison, Manchester, granite base and steps and mosaic floors; Messrs. Homan & Rodgers, Manchester, fireproof floors and ceilings; Messrs. Pearson & Brown, Manchester, fittings to banking-room and wood-block flooring; Mr. Hand, Oldham, decorating and painting; Mr. Davenport, Oldham, wrought ironwork; Mr. Schofield, Oldham, ventilator; Messrs. Kaye & Sons, Leeds, locks; Mr. R. Middleton, Leeds, hydraulic lift; Messrs. Guthrie & Co., Glasgow, lead lights; Messrs. Standring & Co., Manchester, gas-fittings, &c. The whole has been designed and carried out under the superintendence of Mr. Thomas Taylor, architect, Oldham.

NEW GOODS-RECEIVING OFFICE FOR MESSRS. PICKFORD & CO.—Messrs. Pickford & Co. are about to open an extensive new goods-receiving and forwarding office at No. 34, Queen-street, Cheapside. It is entered by a lofty gateway which occupies the greater portion of the lower part of the frontage of a new block of offices and warehouses erected by Messrs. Pink, Fryer, & Co., of Bloomburg-street, Westminster, Mr. Robert J. Worley, of Cannon-street, being the architect. The goods depôt is large, light, and spacious, and from it an easily stepped incline, paved with granite setts, leads down to a stable for thirteen horses. Although this stable is below the ground level, it is light and well-ventilated. The floor of the stable is paved with Claridge's patent asphalte laid on a solid bed of concrete 1 ft. thick. The asphalte surface is 1¾ in. thick, except where the groovings for foothold occur. These groovings are V-shaped in section and cross each other at right angles, forming small squares. There is no stable-drain, except the one to catch the waste from the water-trough. It is intended to use peat or other similar litter for the horses, and this will absorb the urine from the horses and will be frequently removed, so that no drainage will be required other than that mentioned, so we were told by Mr. Bowles, the foreman of the works.

NEW OLYMPIA CIRCUS, EDGE HILL, LANCASHIRE.—The new Olympia Circus in Overton-street, Edge Hill, capable of accommodating over 2,500 spectators, was opened on the 29th ult. It has been designed by Mr. J. Havelock Sutton, architect, of Liverpool. The building is of brick, covering a large site. An entrance through a hall, paved with tiles and finished with light and dark oak adorned with bevelled glass, gives access to two staircases, one on either side, leading to the stalls, side, and private boxes, &c. The interior has been finished and decorated by an Italian artist, Signor Dondy, and assistants. Over a tier of private boxes is a device of the Royal arms, draped with the flags of all nations, relieved by medallions of crimson leather. Attached to the circus are stables.

HIGHWEEK CHURCH, NEWTON ABBOT. — This church was reopened on the 1st inst., having been closed some months for alterations and additions. The chancel and south aisle have been extended, and the organ, which stood in a tower gallery, has been placed at the east end of this aisle, the gallery being removed, and the tower opened up. The work has been carried out from the designs of Messrs. Tait & Harvey, of Exeter, by Messrs. Parker Bros., of Newton Abbot, the new oak choir stalls and west screen being executed by Messrs. Luscombe, Exeter.

EXTENSION OF PREMISES, CO-OPERATIVE STORES, LEEDS.—The Leeds Industrial Co-operative Society is about to make an addition to its central stores in Albion-street. A frontage of 80 ft. on the west side of Albion-street, with a depth back of 104 ft. to Upper Mill-hill, has been acquired. The area of the site to be covered by the new structure is 1,000 yards. The basement floor, having an area of 560 yards, will be utilised for the storage of furniture. In addition, provision will be made for a gas-engine, for electric light, for heating and ventilation apparatus, and other purposes. The ground floor will be divided, with a two-thirds frontage to Albion-street for drapery, and one-third for furniture. Each department will be approached through the large central entrance, and purchasers will be able to pass from one department to the other without going outside. In addition, provision will be made for the loading and unloading of goods. Parcel-rooms, store-rooms, and lavatories will also be provided. The first floor will be divided similarly to the ground floor. The second floor will contain rooms for fur goods, for reserve stock, for the mantle and millinery department, and also dining-rooms, kitchen, lavatories, &c. The third floor will be devoted to workrooms and stockrooms. The elevation to Albion-street will be of local stone, and the other elevations will in all probability be faced with white glazed bricks. The rooms will be carried on iron girders and iron columns, and will be made fireproof. The designs have been prepared by Mr. W. S. Braithwaite, architect, of Leeds, who will superintend and carry out the works.

SANITARY AND ENGINEERING NEWS.

THE SANITARY INSPECTORS' ASSOCIATION.—The ninth annual dinner of this Association will be held on Saturday, March 12, Dr. B. W. Richardson, President, in the chair.—A movement is on foot amongst the members for a visit to Paris for a few days. It is proposed that the party shall leave London on Thursday, June 2, returning from Paris on Monday, June 6. At the sitting of the Society of Hygiene of France, on January 8, Dr. Pietra Santa made a communication which he had received from Dr. Richardson, F.R.S., of London, President of the Sanitary Inspectors' Association, respecting the proposed visit. Upon the proposition of the Secretary-General, the Society of Hygiene decided, by acclamation, that it would do all in its power to receive heartily the sanitary inspectors of Great Britain. All necessary steps would be taken with the Municipal Council and public bodies of Paris to facilitate the visits to the fields of irrigation of Gennevilliers and other establishments which are likely to be of interest. A banquet will also be given to the visitors. A committee of twelve members, consisting of MM. Cacheux, Féret, Joltrain, Dr. E. Monin, Joseph de Pietra Santa, Nicholson, Michaels, Ch. Clifort, Bruhat, Rogers, and Dr. Paul Chevandier, with power to add the names of other members who may wish to show their goodwill towards the visitors, was immediately nominated to carry out the details of the reception.

TESTIMONIAL TO A SANITARY ENGINEER.—On the 23rd ult., at the Cutlers' Hall, Sheffield, Mr. Gustav Alsing, formerly Engineer of the sewage works at Blackburn Meadows, was presented with a testimonial in recognition of his services to the town. The testimonial consisted of a cabinet of cutlery and a travelling-bag. An ornamental plate bore the following inscription:—"Presented to Mr. G. Alsing, A.M.I.C.E., on the termination of his engagement as Engineer to the Sewerage and Rivers Department of the Sheffield Corporation, in acknowledgment of the valuable services rendered by him to the town, and his uniform courtesy in the fulfilment of his duties." The chair was taken by Mr. T. J. Flockton, and among those present were Aldermen William Smith and H. Bramley, Councillors W. E. Clegg and J. R. Lockwood, Mr. John Merrill, Mr. Frederick Fowler, Mr. J. D. Webster, and Mr. Charles Hadfield (representing the Sheffield Society of Architects and Surveyors). A letter was read from Mr. C. J. Innocent (President of the Sheffield Society of Architects and Surveyors) regretting his inability to be present.

THE MAIN DRAINAGE OF BOURNEMOUTH: THE EXTENSION SCHEMES. — Last week a Local Government inquiry was held in the Board-room, Town-hall Buildings, Bournemouth, by Col. J. O. Hasted, R.E., respecting the application made by the Bournemouth Town Council to borrow 24,000*l.* for works of sewerage. The Borough Surveyor, Mr. F. W. Lacey, A.M.I.C.E., gave details as to the proposed schemes. From these it appeared that the No. 1 scheme comprised an enlargement of and additions to the existing central sewer, including an additional 3 ft. outfall 2,150 ft. long, to be laid east of the pier. A large iron sewer in connexion with this outfall will run through the gardens. This scheme will cost 12,000*l.* The second scheme comprises an enlargement of and additions to the existing eastern sewers, with a new 3 ft. outfall of 1,400 ft. in length, east of the Boscombe Pier. This will cost 11,000*l.* The third scheme deals with a re-arrangement of the Wimborne-road sewer, and is to cost 1,000*l.*

PROPOSED BRIDGE, &C., STOCKPORT. — It is proposed to construct a new bridge and road to connect Chestergate with Heaton-lane, at Stockport, on the low level. This improvement will consist not only of the new bridge and road, but also the appropriation of a large area of land known as the Mersey Mill site up to Wellington-road, which will form an open space. The levels of the streets adjoining this land vary considerably, the open space at Wellington Bridge being a considerable depth below the Wellington-road. The scheme will provide for making this land comparatively level with Wellington-road between the river and Heaton-lane. The approaches to the bridge on the Chestergate side, along Chestergate itself, will vary from 1 in 30 to 1 in 40. The bridge is to be of a lattice tubular form, and will be of steel, having a span across the river of 80 ft. The width inside between the parapets will be 54 ft. The question of the construction of the bridge and the utilisation of the land has been the subject of a Local Government Board inquiry, by which authority it has been approved. The work has been entrusted to Mr. A. M. Fowler, M.Inst.C.E., of Stockport and Manchester.

FOREIGN AND COLONIAL.

FRANCE.—M. Courtois-Suffit, architect, has been commissioned to design the monument to be erected in Paris to the memory of Théodore de Banville. The poet's bust will be modelled by M. Roulleau. ——MM. Falguière and Mercié have completed the monument to Alfred de Musset, which is to be erected on the Place d'Augustin at Paris. The poet is represented seated, his eyes fixed on a lyre. Before him passes an allegorical figure of the Muse, scattering roses.——M. E. de Joly has been delegated by the Société Centrale des Architectes to take a place on the jury which is to decide the competition for the Museum of Sculpture and Painting at Nantes.——At Molière there has been discovered a subterranean habitation composed of seven grottoes with pointed roofs separated by a central gallery. A great number of bones have been found, and it is supposed the grottoes served as a refuge for the inmates of a neighbouring convent during the religious wars.——A serious accident has happened at the building in progress for the International Exhibition at Tours: a whole pavilion, 40 mètres long, fell at once, injuring many of the workmen in its fall.——It is announced that the inhabitants of Hyères are about to erect two triumphal arches in honour of the Queen of England, one at the railway station and the other at the Place de la Rade.——At the Museum of Montpellier a new gallery has been opened specially for the designs and drawings of Alexandre Cabanel. In the middle of the gallery will be placed a bust of the celebrated painter, by M. Paul Dubois. Near it will be placed his palette, his brushes, and the numerous decorations which he had received. ——The old houses at Rouen, so characteristic in their plans and in their half-timber work, are beginning to give way to the attacks of time. A fortnight since, a house in the Rue Martainville fell down; last week there followed another equally curious example, No. 21, Rue du Bac. If the Municipality do not take some steps to preserve them, there will soon be no more left of these in-

teresting structures. —— Dr. Cosse, who died recently at Paris, has left his fine collection of works of art to the museum at Nantes.——The Municipal Council at Nantes has voted 65,000 francs for the erection of the fine fountain by Bartholdi which, in the Exhibition of 1889, stood in the central gallery leading to the Galerie des Machines.

BERLIN. — The memorial church to the late Emperor William I., which is in course of erection in one of the suburbs, is to be inaugurated on March 22, 1895. This statement sounds strange when one hears that of the 1,800,000 marks necessary to complete the building only 950,000 are forthcoming. By order of the Emperor, a collection is to be held throughout the country for the purpose of raising the funds, but how much will be obtained is very questionable.——Professor Raschdorff's latest design for the proposed Berlin Cathedral was put before a Commission of high State officials last week, prior to its publication for the members of the Prussian Parliament. It seems absolutely impossible to ascertain if a reliable estimate of the cost of the cathedral has been worked out; one only hears of the total sum of ten millions.——The Imperial Government has voted a sum of 75,000 marks (some 3,750*l.*) towards expenses to be incurred by artists and craftsmen exhibiting at the Chicago Show.——Some fifty architects and engineers from all parts of Germany assembled on the 24th ult. to hear some proposals of the German Special Commissioner relative to the two professions being well and practically represented at the Chicago Exhibition. Although the professional men of the different countries or cities of the Empire intend exhibiting separately or in small groups, there is to be some unity in their groups in the German section; and for this purpose, after much debating, a central committee, with its headquarters at Berlin, has been elected. It is interesting to note that architects are advised to send designs of practical work and not of ideal schemes.—— The Emperor will attend the ceremony of laying the foundation-stone of the Kyffhäuser Monument in memory of the late Emperor William. The date selected is May 10.——The great Opera ball took place on the 24th ult., and, as usual, the complicated transformation of the auditorium and stage into a ball-room was cleverly done. This time, combinations of evergreens and water (small fountains and cascades) were used for the decoration of the stage, with good effect.——"Geh. Oberbaurath" Wiebe, a civil engineer and Government official of repute, died last week in his eighty-eighth year, and was buried with great ceremony. He played a most important part at the time when Berlin received its new sewage system, and has of late years done much good work throughout the country as technical adviser to sanitary boards.

VIENNA.—The proposed international "Musical and Theatrical Exhibition," before alluded to, is exciting interest among the educated classes of the capital, and we hear that a very fair show is expected as far as German, Italian, Swiss, and home exhibits are concerned. From England and France little is apparently expected, although a well-represented section from each of these countries would be absolutely necessary before the word "international" could be justified, and the Austrians would only be too glad to be able to rightly affix this word to their show. Preparations are being made with energy, and the large halls of the Prater Exhibition Building are nearly ready for the reception of exhibits, due next month. As before observed, a temporary "model theatre" is being run up, in which dramatic or operatic companies from all parts of the Continent are to play in turns. This building is now roofed, and promises to be an object of interest for architects both as regards to plan, interior arrangements, and stage-fittings. Messrs. Fellner & Helmer, the Austrian theatre specialists, have designed it to hold an audience of 1,500, of which a thousand are placed on the sloping floor of the auditorium, and the rest on a balcony; the stage has a total depth of 26 mètres and a proscenium opening 13·50 mètres wide; measurements large enough to permit the rendering of any play. The material used for the erection is mainly timber, which has been painted over with one of the so-called fire-proof washes; coatings of asbestos have been used on the main partition wall and the curtain to the stage opening. The exits have been so arranged as to permit a clearance of the house within three minutes. Electric lighting has been adopted throughout the building, a system of ventilation which will permit an influx of 60,000 cubic mètres of fresh air every hour is to be carried out, and the compulsory high-pressure water distribution laid on.

SWITZERLAND.—Last year a new theatre was completed at Zurich. Now another large place of amusement is to be erected in this city. A competition has been opened for the design of a block, containing some assembly-rooms, two concert halls, a restaurant, &c. One of the concert halls is to hold an audience of 1,400. The cost of the building is not to exceed 1,200,000 francs.

OLDENBURG.—In place of the Court Theatre, which was destroyed by fire shortly before Christmas, a provisional one, with a seating capacity for an audience numbering 840, has been erected. In spite of a severe spell of cold weather, it only took seven weeks to put up this building, the construction of which shows points of interest, as various patent fabrications, such as plaster-boards, cement and wire combinations, have been used for the vertical surfaces, the necessary support being given by a timber framework.

HEIDELBERG.—The Government of the Duchy of Baden has voted some 12,500*l.* towards works on the historical Heidelberg Schloss. The works to be taken in hand include a thorough drainage of the very damp site on which the castle stands, some alterations in the old castle-yard, and the taking of plaster-casts of the more valuable pieces of sculpture and "relief" work on the façades of the castle proper.

SWEDEN.—Herr Carl Möller, a prominent Swedish architect, has been commissioned to restore the ancient Church of St. Christina in Falun. It contains a large quantity of beautiful old wood carving, partly still in its place, and partly stored away in a loft. All will be carefully placed in the original position.——In order to raise further funds for an Artists' Club, in Stockholm, an exhibition of paintings with lottery is to be held, to which Prince Eugen, Prof. Kronberg, and other leading artists are contributing paintings.——A large quantity of the interior artistic fittings and decorations in the Old Opera House in Stockholm, just closed in order to make room for a new one, and dating from about 1600, is to be removed to the Northern Museum of Antiquities.——It is intended to build a new lunatic asylum in Stockholm, at a cost of 12,000*l.* ——In order to afford greater safety for men at work on the roofs of houses, the City Board has adopted some further regulations. In addition to iron handrails or chains, the workman is to have a rope and lifebelt attached to the former, whilst chimneys of more than 1·2 mètre in height are to be fitted with iron ladders, and having at least, on three sides, handrails. —— An electrical central station has been opened at Helsingborg, constructed by Messrs. Siemens & Halske, of Berlin. It is intended for feeding 1,000 lamps.

ELECTRIC LIGHTING IN SOUTH AFRICA. — The progress of electric lighting in South Africa is indicated by the list of works carried out or projected in Pretoria by Messrs. Woodhouse & Rawson during the past year. These consist of the preparation of plans and specifications for the electric lighting of Pretoria; the supply and erection of plant for lighting the works, both above and below ground, of the City and Suburban Gold Mining Company and the Metropolitan Gold Mining Company; the lighting of the Battery House of the Van Ryn Gold Mining Company; the lighting of the Globe Theatre, Pretoria; and the preparation of the plans and specifications for transmission of power by means of electricity, for Moodies Gold Mining and Exploration Company.

MISCELLANEOUS.

WINCHESTER CATHEDRAL BELLS.—We are informed that Mr. John Colson, F.R.I.B.A., the architect to Winchester Cathedral, has suggested that the bells at present hanging in the tower should be taken down and re-hung with the two hoped-for new ones in a temporary structure until a proper campanile can be built for them. By doing away with the two floors and removing the vaulting to a position in which the defects of its construction would be less obvious and its beauty of design better displayed, the rich interior of a most magnificent Norman lantern, hidden now save to those who can climb a close winding stair, would be open to the view of all, and the bells, at present muffled by walls never meant to enclose them, could speak their message far and wide.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.—On Saturday afternoon the students attending the Greenock Class in Plumbers' Work paid a visit to the meter department of the gas-works in Crawfurd-street. The different sections of the works, the construction, management and care of wet and dry meters, photometers, gas-testing, meter-testing, &c., were very ably described by Messrs. Maitland, Fordyce, McCubbun, and Wright.

FOG.—In no case can it be supposed that scientific measures will prevent the inevitable formation of mist; but if London fog can be stripped of its colour which is coincident with its irritating character, and which is due to the presence of carbon particles, tarry matter, and sulphur, then a vast improvement will have been accomplished, and a giant stride onward in hygienic science achieved. As we have pointed out more than once, even when coal is perfectly burnt or consumed, we still have to deal with the products of combustion of sulphur, which element occurs to the extent of from 1 to 2 per cent. in most kinds of coal. Carbon, hydrogen, sulphur, and nitrogen in coal, when completely burnt in air, produce carbonic acid (CO_2), watery vapour (H_2O), sulphurous and sulphuric acids (SO_2 and SO_3), and a trifling quantity of free nitrogen. Given, therefore, the complete consumption of the coal,—that is to say, that no smoke or unburnt carbon is produced,—what is to be done with the combustion products of sulphur? and how will these products (SO_2 and SO_3) alter the character of the fog? We suggested in a leading article some time ago that probably lime or any of the alkalies placed at some point in the chimney could be used to absorb these acids, and those who claim to have secured the perfect combustion of coal by the adoption of a particularly constructed stove should be induced to put this simple suggestion into practice.—*The Lancet.*

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—On Wednesday a paper on "Some Practical Notes on the Water-supply of Boilers, and its Treatment," was read by Mr. R. J. Friswell, F.I.C., F.C.S., &c., in which a number of patents taken out between 1882 and 1891 were described, and comments made on them. The true cause of boiler incrustation was considered, and its origin traced to the enormous solvent powers of water and the character of the earth's surface. The probable cause of the presence of other than the strictly insoluble constituents of boiler deposits was indicated, and attention called to some unusual kinds of river water. Methods of treatment were then taken in hand, and it was argued that treatment previous to use is best; Clark's process was described, and modern improvements of it glanced at. Mr. Spence's introduction of soda ash was described, and also its mode of action. Caustic soda was shown to be efficient but dangerous, and silicate of soda as useful but quite safe.

INVENTORS' INSTITUTE.—At the last meeting of this Institute, Dr. Glover Lyon in the chair, Mr. Walter Smartt (Member) read a paper "On Improvements in Burning Bricks, Soft-core, and other matters, without causing nuisance." The author has patented special means of roofing-over clamps, and treating the gaseous emanations therefrom for the purpose of removing the nuisances which cause so much complaint, and in many cases give rise to serious litigation against the manufacturers of bricks and tiles. A few of the advantages expected are:—Enabling the bricks to be made and burned in places where there are superior materials and conveniences, but where hitherto there has been too strong objection; the protection of the bricks when in clamp from storms and rains and the consequent depreciation of the goods produced; rendering unnecessary the expense of placing extra layers of bricks over the clamp; and expediting the burning of the bricks with the use of less fuel. Associated also with this system would be important results for Sanitary and other local authorities, and the improvement of the value of the surrounding land and of the brickfield when exhausted. In regard to the waste of prepared materials through litigation set up against brickmakers, an instance was given at Hammersmith, where recently, through an injunction, prepared earth to the extent of 3,000,000 of bricks remained unused. And, as to the necessity for more uniform conditions of burning than under the present exposure to all the changes and inclemencies of weather, it was stated that, with a rainfall of 3 in. per month, a large clamp from first to last would receive as much as fifty-six tons of water, the detriment to the bricks being very serious. The paper was closely criticised in the discussion which followed, in which, amongst others, Mr. Picking, of New Southgate; Messrs. Broad, Mead, and Clayton, of Paddington; Mr. Bird and Mr. Williams, of Shepherd's-bush; Mr. Eastwood, of Lambeth; and Mr. Craven, of Wakefield, took part. Mr. Smartt replied to various questions, and stated that it was intended shortly to give a demonstration on a practical scale in one of the brickfields near London.

THE WIND AND ELECTRICITY.—The midst of London is not a promising site for windmills; nevertheless Messrs. Williams, of Great Eastern-street, have erected two such motors,—one on their own premises, and the other on those of Messrs. Carwardine, in the City-road. Like sky-signs, they constitute of themselves conspicuous advertisements. But the sky-signs can be turned to no other useful purpose. The windmill can: and both the firms referred to have for some time made them do intermittent duties. We say intermittent, because of the fluctuating nature of the wind, which is on no two days alike, nor hardly ever without variations of strength from one minute to another. To say nothing of calms, the ordinary fluctuations leave the wind the most uncertain of all the natural sources of power. Windmills, like almost every other machine, have, however, gone through much improvement, and the Halladay type has certain special features which fit it for doing more advanced work than the old mills could possibly be put to. Under these circumstances, the application of the wind to the generation of electricity has really more chance of success than at first sight would appear. For, with a mill-wheel which adapts itself to the blast of the storm or to the gentlest zephyr, working in conjunction with a battery of storage-cells, irregularities of all kinds can be merged into a common tranquil reservoir from which electric current can be drawn off as required with perfect uniformity of pressure. The Halladay mill has a wheel divided into flexible sections, and thus differs essentially from the old rigid wheels upon which the gusts acted with brutal roughness. Each of the Halla-

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
*Artisans' and Labourers' Dwellings	Halifax Corp.	Not stated	April 4

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Additions and Alterations to Church, Selside, Kendal	.....	C. J. Ferguson	Mar. 8
Six Cottages, Queen's-road, Snodland	Rochester Land & Gen. Invest. Co. Lim.	J. W. Nash	do.
Bridge, 30-ft. span, Marshaw Cragg, Yorks	.....	Sam Shaw	do.
*Road Materials	St. Saviour's B. of W.	*Official*	do.
Drainage, Torpoint	St. German's R.S.A.	do.	Mar. 9
Earthenware Pipes, &c.	Northwich Loc. Bd.	do.	do.
*Supply of Materials	Colchester Town Coun.	do	do.
*Oak Fencing	West Ham Union	do.	do.
*Road Making and Paving Works	Hammersmith Vestry	H. Mair	do.
School Buildings	W. Hartlepool Sch. Bd.	J. M. Bottomley	do.
Making-up Land, St. Denys, Southampton	Hants Land & Building Soc.	W. B. Hill	do.
Two Semi-detached Cottages, Farmbuildings, &c. Elgin, N.B.	.....	Geo. Sutherland	Mar. 10
Two Filter Beds, Trench Cutting, &c.	Thurlstone Loc. Bd.	G. & G. H. Crowther	do.
*Brick and Concrete, and Pipe Sewers, &c.	Twickenham L. B.	G. B. Laffan	do.
*Making-up Roads	Hornsey Loc. Bd.	T. de Courcy Meade	Mar. 11
*Sewerage Works	do.	do.	do.
*Two Cottages	do.	do.	do.
*Works and Materials	do.	do.	do.
*Iron Fencing with Gates	do.	do.	do.
*Supply of Materials	do.	do.	do.
Two Houses and Shops, Lightcliff, Halifax	.....	H. Pyrah	Mar. 12
Alterations and Additions to School	Lytchett Minster Sch. Bd.	H. F. J. Barnes	do.
Waterworks (Contract No. 1) and Tunnel	Pembroke T. C.	Mr. McAlpin	do.
*Maintenance and Repair of Main Road	Middlesex C. C.	F. H. Pownall	Mar. 14
*Broken Blue Guernsey Granite	do.	do.	do.
Infirmary Block and Workshops, Asylum, near Bridgend	.....	Giles Gough, & Trollope	do.
Alterations to Town Hall, Blaenavon, (Mon.)	Westlake's Brewery (Ltd.)	E. A. Larsdown	do.
Alterations and Additions to Premises Academy-street, Elgin, N.B.	.....	Jas Jamieson	do.
Road Metal, Flagging, &c.	Plymouth Corporation	G. D. Bellamy	do.
School Building	Norton (Sheffield) Sch. Bd.	T. H. Wilson	do.
*Supply of Road Materials, &c.	St. Mary, Newington, Vestry	*Official*	do.
Iron Screw Pile Lighthouse, near Newport Mon.	Trinity House Corp.	do.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor or Engineer.	Tenders to be delivered.
*Works and Materials	Finchley Local Board	*Official*	Mar. 14
*Works and Materials	Tottenham Loc. Bd.	do.	do.
*Widening Railway between Ruxton and Standish	L. and N. W. Railway	do.	Mar. 15
Two Shops, Commercial-street, Halifax	.....	Utley & Gray	do.
*Roadmaking and Tarpaving Works	Lewisham Bd. of W.	*Official*	do.
*Roadmaking and Paving Works	Fulham Vestry	W. Sykes	Mar. 16
*Central Library, Peckham-road	Camberwell Commrs.	R. P. Whellock	do.
*Bridge over River Mersey	County Borough of Stockport	A. M. Fowler	do.
Sewerage Works	I. of Wight R.S.A.	W. Lidstone	do.
*Constructing Roadway	Wandsworth and Clapham Union	T. W. Aldwinckle	Mar. 17
*Cast-iron Mains, &c. for Water Supply	Shardlow Union	G. Hodson	Mar. 19
Wrought-iron Roof, Kirkgate Market, Leeds	Leeds Corporation	T. Hewson	do.
Alterations to Hotel Premises, High-street, Elgin, N.B.	.....	C. C. Doig	do.
*Additions, &c. to Claybury Hall	Asylums Com. L.C.C.	G. T. Hine	Mar. 21
Dwelling-house, Grantown-on-Spey, N.B.	.....	Brown & Watt	do.
*Painting, &c. Coroner's Court	St. Luke's Vestry, Middlesex	*Official*	Mar. 21
*Repairs, &c. to Chimney Shaft	Commrs. for P. B. & W. St. Giles, &c.	J. Waldram	Mar. 23
*Infirmary, &c.	Parc Gwyllt Asylum, near Bridgend	Giles, Gough, & Trollope	April 4
*Public Baths	Corp. of Coventry	*Official*	do.
Entrance Lodge, Allt-yferin, Carmarthenshire	E. H. Bath	Wilson & Mowham	No date
Stables and Clock Tower, do.	do.	do.	do.
*Married Soldiers' Quarters, Eastbourne	War Department	*Official*	do.
Re-building "Globe Hotel," &c. Abertillery, Mon.	Mrs. Edwards	Alfred Swash	do.
Railway Embankment and Siding, Pontypridd	Brown, Lennox, & Co.	.....	do.
Widening Bridge, Upleatham, Yorks	.....	Walker Stead	do.
New Wing, Aske Hall, Richmond, Yorks	.....	Clark & Moscrop	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Assistant Engineering Surveyor	Birkenhead Corp.	120*l.* &c.	Mar. 8
*Engineer	Commrs. of Public Baths, &c. Chelsea	2*l.* 10s.	Mar. 9
*District Surveyor	Everley and Pewsey Highway Board	160*l.*	Mar. 10
*Clerk of the Works	Guildford T. C.	3*l.* per week	Mar. 15

Those marked with an Asterisk (*) are advertised in this Number. *Competition, p.* iv. *Contracts, pp.* iv., vi., & viii. *Public Appointments, p.* xxiii.

day sections is connected to a counterpoise, and the balance is so nicely adjusted that the wind turns the sections back to angles greater or less according to its own force, thus tending to maintain uniformity of power in the wheel from winds of all strength,—the vane always acting as a rudder to keep the face of the mill towards the wind. The mill thus constantly settles to its work, and is in no danger of being wrecked. As the current for lighting is only required for a few hours periodically, and the mill and the dynamo have all day to generate and store, there ought to be an easily ascertainable amount of storage to suffice for the occasional occurrences of calms. The windmill must not be allowed to race the dynamo; and the mill can in large degree govern itself. The dynamo's number of revolutions per minute will depend on the speed of the mill, but the electric generator must not be allowed to send too strong a current to the storage cells. By putting an ordinary governor on the spindle of the dynamo it can be made, as the governor moves swifter or slower, to put on more or less resistance coils, and so maintain a uniform charging current of the capacity required. The overcharge of the battery being provided for, any inopportune discharge from it is guarded against by a contact-maker, which fundamentally cuts out the generated current when too weak for charging the cells, but automatically applies itself to pass the current when of the requisite capacity. The little installation at Messrs. Carwardine's, which has been carried out by the Wenham Company, Ltd., runs two arc lights of nominal 1,500 candle-power and a few incandescents. A year's experience of its working will afford useful data for the extension of wind-power to the generation of electricity.

COUNTY COUNCIL ELECTIONS.—Mr. Silvanus Trevail, architect, Truro, has just been returned unopposed as the representative for the Eastern electoral division of that city in the Cornwall County Council. Mr. Trevail's return for the same division in the first County Council was also unopposed.

THE SURVEYORS' AND AUCTIONEERS' CLERKS' PROVIDENT ASSOCIATION.—The annual report of this Association, which was submitted at the annual meeting of members, held at the Auction Mart, Tokenhouse-yard, on Wednesday last, states that the number of members in the respective divisions of the Association is as follows,—viz.: Sick allowance fund, 43; life assurance fund, 28; superannuation fund, 8; and benevolent fund, 6. The sick allowance for the year has amounted to about the normal expectation, and exhibits a pleasing contrast to the heavy demand made in the previous year, owing to the epidemic of influenza. A small grant from the benevolent fund has been made in one case. The total grants from this fund up to the present time amount to 28*l.* No claim has yet been made upon the life assurance fund. The whole of the outlay of the Association for the year has been met out of the income received from investments. A further sum of 200*l.* has been invested, making the satisfactory total of 2,503*l.* The Committee thank the honorary subscribers for their continued support; also the directors of the Auction Mart for the use of a room for meetings. The report was adopted.

THE ENGLISH IRON TRADE.—The approaching stoppage in the coal trade has had the effect of further restricting business. As the supply of fuel is likely to be extremely limited, many ironmasters have taken the precaution of issuing notices to their men for the period during which the stoppage will apply. The statistics issued by the British Iron Trade Association show that the total production of pig-iron during the year 1891 was 7,228,496 tons; of Bessemer steel, 1,642,005 tons; and of open-hearth steel, 1,514,538 tons, exhibiting decreases, as compared with 1890, of 646,634, 372,838, and 49,662 tons respectively. Pig-iron prices generally are tolerably firm, with little business passing. Scotch makers' iron is very quiet, with quotations lower. Finished iron is in but moderate demand, and no further change has taken place in the position of tin plates. The steel trade generally is quiet. Shipbuilding shows fair activity, so far as launches are concerned, but new orders are scarce. The engineering and allied trades are slack. The coal trade exhibits great activity with the approach of the stop-week, which will be almost general.—*Iron.*

PARTNERSHIP.—Messrs. Ashbee & Sons, timber and slate importers, Gloucester, inform us that they have taken into partnership Mr. C. W. Estcourt, and that the business will in future be carried on under the style of "Ashbee, Sons, & Co."

LEGAL.

SURVEYOR'S FEE FOR NEGOTIATING PURCHASE.

LOVEGROVE *v.* TRUMAN, HANBURY, & CO.

THIS was an action in the Mayor's Court, Guildhall, brought by Mr. Henry Lovegrove, of 26, Budge-row, City, against Messrs. Truman, Hanbury, & Co., the well-known brewers.

Ms. Lewis Glyn (in the unavoidable absence of Mr. Edward Boyle), instructed by Messrs. Anyone & Bromwich, appeared for the plaintiff; and Mr. Paul Taylor, instructed by Messrs. Hanbury, Hutton, & Whitting, appeared for the defendants.

Mr. Lovegrove stated that in the autumn of 1889 he was acting for the defendants' lessees in Fetter-lane, and when at the brewery on a day in November of that year the acquirement of an adjoining slip of land was discussed, and Mr. Fraser requested the plaintiff to try to purchase the property. After this, for some weeks, the plaintiff was in communication with the vendors, and eventually purchased the land conditionally on giving up some rights of light.

The defendants' evidence proved that such an interview took place, but they considered that plaintiff was acting on behalf of their tenant. The judge, in summing up, pointed out that the land was conveyed to the defendants, and afterwards sold by them, and it was evident that the plaintiff, and nobody else, had arranged the matter.

The jury gave a verdict for the plaintiff for the amount claimed and costs.

MEETINGS.

SATURDAY, MARCH 5.

Architectural Association.—Visit to St. Saviour's, Southwark, by permission of Sir Arthur W. Blomfield, A.R.A. 3 p.m.

Institution of Civil Engineers.—Students' visit to the Oil-gas Works of the Great Northern Railway at Holloway. 3 p.m.

MONDAY, MARCH 7.

Royal Institute of British Architects.—(1) General Business Meeting to ballot for candidates. (2) Special General Meeting (*a*) to elect the Royal Gold Medallist for the current year (*b*), to receive and consider an amended paper of "Suggestions for the Conduct of Architectural Competitions," recommended for adoption by the Council. 8 p.m.

Royal Academy of Arts.—Professor J. H. Middleton on "Michael Angelo" III. 8 p.m.

Society of Arts (Cantor Lectures).—Professor William Robinson on "The Uses of Petroleum in Prime Movers." II. 8 p.m.

Society of Engineers.—Mr. Stephen Sellon on "Electrical Traction and its Financial Aspect." 7.30 p.m.

Liverpool Architectural Society.—Mr. D. Harrison on "Pre-historic Rome." 6.30 p.m.

TUESDAY, MARCH 8.

Institution of Civil Engineers.—Professor W. C. Unwin on "Petroleum Engines." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. F. J. Sykes on "General Powers and Duties of Inspectors of Nuisances." 8 p.m.

Sheffield Society of Architects and Surveyors.—Mr. J. A. Gotch on "How they Built in Shakespeare's Time," illustrated with lantern slides.

WEDNESDAY, MARCH 9.

Architects' Benevolent Society.—Annual General Meeting of subscribers and donors, the President, Mr. J. Macvivar Anderson, in the chair. 5 p.m.

Society of Arts.—Mr. A. P. Laurie on "Experiments on the Durability of Modern Pigments." 8 p.m.

British Museum.—Miss Eugénie Sellers on "Greek Sculpture: Sculptures from the Temple of Artemis (Diana) at Ephesus." V. 2.30 p.m.

Sanitary Institute.—Dr. Louis Parkes on "The Air and Water of London: Are they Deteriorating?" 8 p.m.

THURSDAY, MARCH 10.

Society of Antiquaries.—8.30 p.m.

Edinburgh Architectural Association.—Mr. J. Balfour Paul on "Heraldry in Relation to Architecture." 8 p.m.

Dundee Institute of Architecture.—Mr. T. Claxton Fidler on "The Evidences of Scientific Knowledge and Constructive Skill in the Remains of Ancient Architecture and Engineering." 8 p.m.

FRIDAY, MARCH 11.

Institution of Civil Engineers (Students' Meeting).—Mr. James B. Ball on "The Manufacture of Oil Gas at the Holloway Works of the Great Northern Railway Company." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. F. J. Sykes on "Objects and Methods of Inspection." 8 p.m.

Bradford Historical and Antiquarian Society.—Mr. Butler Wood on "Some Old Bradford Artists." 8 p.m.

SATURDAY, MARCH 12.

Sanitary Inspectors' Association. — Ninth Annual Dinner, First Avenue Hotel, Holborn. Dr. B. W. Richardson, President, in the chair. 6 p.m.

Edinburgh Architectural Association.—Visit to Roslin Chapel and Roslin Castle.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

5,203.—WINDOWS: *W. Hughes.*—This specification refers to a new sash spring-coil and axle-pulley. A spring made of thin steel is inserted in a hollow groove of the wheel of an axle pulley, the pulley being fixed to either casement or solid frame window. The spiral spring is wound up tight and held in position by means of pins, which run through it and connect it with the axle of the pulley; the spring coil runs outside the wheel, to which it is also fastened. When the window is opened the spring coil pays out. When closed, it winds up, being set in action and governed by the spring inside the pulley wheel. No cords or other appliances are required, and the pulley, made of cast-iron, is simply let in flush with the woodwork and inside of sash. Two must be attached to the window, one on each side.

14,157.—DOORS: *C. Scriven.*—This patent refers to an improvement on an application dated July 17, 1891, in respect of an apparatus for closing doors, and, if necessary, holding them open in any desired position. This is effected by means of twisted indiarubber or other elastic material, arranged as set out in specification.

14,184.—FIREPLACES: *J. Shaw.*—The inventor claims that by means of the arrangement described below, the effect is to contract the draught space of the chimney, to secure effective combustion of fuel, and to prevent the creation of smoke. A metal pin about 6 in. long is constructed with a spring clip near its centre, for the purpose of fixing on the top of a register or other plate in an open fireplace. The pin is placed horizontally with its shorter end projecting against the inside front of the grate-plate or chimney, the back end projecting towards the chimney-wall, and so maintaining the register in a forward position.

4,981.—DRAINAGE: *H. Clark.*—This invention relates to drains only, and has for its objects the prevention of the passage of sewer-gas, &c., from one part of a system of drainage to another, and the absolute prevention of sewer-gas, &c., rising and accumulating at the higher levels, the provision of sufficient outlets for stench and inlets for fresh air, and to render the use of gullies, syphons, or other traps with a water-seal unnecessary. The invention is carried out by arranging the pipes, and the use of the apparatus as described and illustrated in the specification.

NEW APPLICATIONS FOR LETTERS PATENTS.

February 15.—2,899, T. Potter, Building Monolithic Concrete Walls.—2,912, H. Jenning, T-square Drawing-easel for the use of Architects, Engineers, and Surveyors.—2,932, J. Salomon, Pottery-ware Domestic Stoves for Heating Purposes.—2,951, C. Logan, Wire Nails.—2,964, M. Kann, Apparatus for use in Working Stone —2,967, H. Woodhouse, Firegrates or Stoves.

February 16.—3 007, R. Wylde, Chimney-pots.—3,015, H. Haddan, Manufacturing Screws.—3,016, G. Lawford, Closet Connexions.—3,021, A. Frisby, Construction of Machinery for Carving Wood and other Compressible Materials.

February 17.—3,083, R. Walker, Machine for Grinding Portland Cement.—3,093, J. Carr, Mortising Chisel.—3,101, W. Jackson, Chimney-pot.—3,125, J. Bridson, Brick for Building Purposes.

February 18.—3,201, D. Halpin, Treads for Stairs.—3,215, C. Pryce, Kilns.

February 19.—3,220, F. & J. Butterfield & Co., Limited, and W. Pearson, Mechanism for Operating Band-saws.—3,266, J. Jones, Drainage Appliances —3,286, J. Caldecourt, Sockets or Joints of Rain-water Pipes.—3,299, J. Leighton, Chimney Cap or Cowl.—3,302, W. Jones, Water-waste Preventer.—3,304, F. Pateman and J. Ashman, Chimney-top, Pot, Cowl, or Ventilator.

February 20.—3 356, R. Bell, Apparatus for Heating Dwelling-houses, Hotels, and other Buildings.

PROVISIONAL SPECIFICATIONS ACCEPTED.

21,589, W. Dawkes, Valves for Flushing Cisterns, superseding separate air-pipe and affording an after flush.—22,322, W. Jacques, Fire-exit Door, Lock, and Alarm.—285, R. Barker, Sewer-pipe and Drain-tile Machines.—286, R. Barker, Sewer-pipe and Drain-tile Machines.—308, William Sykes, Jointing Earthenware, Concrete, and other like Pipes.—488, T. Wilkinson, Joints for Sewer and other Pipes —600, R. Rhodes and R. Holland, Domestic Hearths.—680, F. Noar, Lead Service Piping.—907, C. Johnson and A. Wilson, Joints for Pipes, constructed of stoneware, earthenware, concrete, &c.—939, A. Baxter, Connecting Earthenware Sanitary Appliances.—1,039, G. & C. Rollason, Joints for Hot-water Pipes.—1 041, S. Rollason, Generating Electricity for Buildings.—1,114, W. Copping, Bolts or Fastenings for Emergency Doors of Public Buildings.—1,154, W. Riley, Knobs of Door-handles and for adjusting and holding them upon the spindles.—1,196, J. Banks, Flush and other Bolts.—1,238, J. Smeaton, Water-closets.—1,281, H. Dowty, Hot-water Pipes and Connexions.—1 336, P. Mooney, Earthenware Gully Traps.—1,342, E. Hunt, Gasaliers and Chandeliers.—1,357, H. Wethered, Ventilation of Closet, Basins, and Water-closets —1,514, W. Thompson, Grinding Tools.—1,603, J. Merry, Syphon-flushing Apparatus for Water-closets.—1,628, S. Gratrix and others, Gas Chandeliers.—1,687, H. Brooke, Fittings for Shop-windows, &c —1,742, J. Hudson, Low-water Alarms for Kitchen or Domestic Boilers.—1,857, O. Hawkes, Joints for Faulights, &c.—1 869, W. Francis, Surveying Instruments.—2,161, A. Kershaw, Ventilators.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

3,299, J. Prentice and others, Door-handles.—6,839, J. Fairbank, Gas-fittings.—6,922, A. Damp, Water-closet Cisterns.—18,247, W. Thompson, Nail-driving Tool.—21,997, J. Thompson, Fire-resisting Brick and Material for Lining, Facing, or Coating Fire-places, Fire-boxes, &c.—954, A. Young and R. Chesney, a Lock.—1,052, J. Chappell, Parquet and Block Flooring.—1,062, J. Barber, Device for Curing Smoky Chimneys.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

FEBRUARY 22.—By *R. A. Notley*: Freehold premises, Maltby-st., Bermondsey, area 18,743 ft., 4,500*l.*—By *A. Richards*: F.g.r. of 30*l.*, with reversion in 76 yrs., Elsa-st., Limehouse, 575*l.*—By *Messrs. Willmott*: 26 to 32 even, Vespan-rd., Shepherd's-bush, u.t. 82 yrs., g.r. 25*l.* 4s., 450*l.*—By *Prickett, Venables, & Co.*: 44, Florence-rd., Stroud-green, u.t. 86 yrs., g.r. 7*l.* 10s., r. 40*l.*, 400*l.*; a plot of freehold land, Cecile-pk., Crouch-hill, 1,360*l.*; a plot of freehold land, Gladwell-rd., 1,100*l.*

FEBRUARY 23.—By *Toplis & Roberts*: 44, Hethpool-st., Edgware-rd., u.t. 46 yrs., g.r. 7*l.* 7s., r. 93*l.* 12s., 510*l.*; 85, Park-st., Camden Town, u.t. 28 yrs., g.r. 5*l.*, r. 52*l.*, 400*l.*—By *Debenham, Tewson, & Co.*: "The Oxford Arms" beerhouse, Brushfield-st, Spitalfields, f., r. 50*l.*, 900*l.*; 64 and 66, Brushfield-st., f., r. 125*l.*, 2,000*l.*; freehold premises in Little Paternoster-row, r. 60*l.*, 800*l.*; 31 and 33, Gascony-av., Kilburn, u.t. 88 yrs, g.r. 21*l.*, r. 90*l.*, 510*l.*; 28, 30, and 34, Napier-st., Deptford, u.t. 53 yrs, g.r. 5*l.* 8s., r. 66*l.* 6s., 415*l.*—By *Dowsett & Co.*: A plot of freehold land, Wellington-st., Slough, 1r. 19p., 250*l.*; a plot of freehold land, ditto, 80*l.*; 84 and 86, Sebert rd., West Ham, f., r. 70*l.* 4s., 675*l.*; 28, Taniwha-ter., f., r. 29*l.* 18s., 300*l.*; "Windsor Cottage," Windsor-rd., Upton-pk., f., r. 26*l.*, 265*l.*; "Chesterton Cottage" and plot of land, Western-rd., Plaistow, 180*l.*; the lease of 95, Woodgrange-rd., Forest-gate, u.t. 12 yrs., 20*l.*—By *A. Young*: The letting of a plot of land, Cheyne-walk, Chelsea, area 7,033 ft., 80 yrs. at 65*l.* per annum; 49, Mount Pleasant, Clerkenwell, f., 650*l.*; three plots of freehold land, Cable-st., Shadwell, 100*l.*; 40, Battersea-bridge-rd., Battersea, f., 425*l.*; 46 to 68 even, Battersea-bridge-rd., f., 4,230*l.*

FEBRUARY 24.—By *W. H. Hilton*: 37, Clifden-rd., Clapton, u.t. 76 yrs., g.r. 5*l.*, r. 26*l.*, 235*l.*—By *D. Young*: 16, Hadley-rd, Barnet, f., 145*l.*; 41, Poplar Walk-rd., Herne Hill, u.t. 75 yrs., g.r. 3*l.* 10s., 240*l.*; 18, Burnley-rd., Stockwell, u.t. 70 yrs., g.r. 6*l.* 10s., 400*l.*; 33 and 35, Dalyell-road, u.t. 72 yrs., g.r. 13*l.* 15s., 430*l.*—By *R. Tidey & Son*: 79, Felton-st., Hoxton, u.t. 26 yrs., g.r. 3*l.*, 105*l.*; 40, Hertford-rd., Kingsland, u.t. 27 yrs, g.r. 5*l.*, 135*l.*; 71 and 73, Hertford-rd, u.t. 26 yrs., g.r. 14*l.*, 275*l.*; 128, De Beauvoir-rd., u.t. 29 yrs., g.r. 4*l.* 5s, 300*l.*; 105, Kingsland-road and goodwill, u.t. 77 yrs., g.r. 20*l.*, 160*l.*; 107, Kingsland-rd., u.t. 30 yrs., g.r. 25*l*, r. 43*l.*, 60*l*; 37 and 39, Ash-grove, Hackney, u.t. 34 yrs., g.r. 9*l.*, r. 52*l*, 400*l.*; 9 and 11, How's-st., Kingsland, u.t 26 yrs., g.r. 15*l.* 8s., r. 72*l.* 16s.; and a l.g.r. of 7*l.* 14s. (same term) 265*l.*; 3, William-st., Islington, u.t. 53 yrs., g.r. 4*l.*, 300*l.*

FEBRUARY 25.—By *B. Brown*: 157, High-st., Poplar, f., r. 24*l.*, 205*l.*; 30 and 31, Ellerthorpe-st., u.t. 51 yrs., g.r. 6*l.* 6s., r. 50*l.* 14s., 310*l*; 4 and 6, Bedford-st., u.t. 14 yrs, g.r. 4*l.* 10s., r. 41*l.* 12s., 100*l.*; 37, Stainsby-rd., u.t. 25 yrs., g.r. 4*l.* 10s., r. 32*l*, 240*l.*; 147 and 149 Grundy-st., Bromley-by-Bow, f., r. 46*l.* 16s, 550*l.*—By *W. W. Jenkinson*: 19, Almida-st., Islington, u.t. 30 yrs., g.r. 8*l.*, 410*l.*; 12, Spa-rd., Bermondsey, f, r. 42*l.*, 495*l.*—By *Debenham, Tewson, & Co.*: "The Rising Sun" beerhouse, Newburn-st., Lambeth, f., r. 65*l.*, 1,000*l.*—By *Warlters & Lovejoy*: The Residence, "Dalkeith," Cambridge-rd., Leytonstone, f., r. 35*l.*, 505*l*; No. 25, Clapham-common, f., r. 50*l.*, 745*l.*—By *Newbon & Co.*: 33 and 35, Frederick-st., Islington, u.t. 59 yrs., g.r. 11*l.*, r. 64*l.*, 500*l.*; 5, Charlesworth-st., Caledonian-rd., u.t. 60 yrs, g.r. 6*l*, r. 30*l.*, 275*l.*; 70, Bride-st., u.t. 69 yrs, g.r. 7*l.* 10s., r. 40*l.*, 380*l.*; 7, 8, and 9, Providence-row, King's-cross, u.t. 99 yrs., g.r. 1*l.* 10s., 285*l.*—By *Stimson & Sons*: 3, East Chapel-st., Mayfair, u.t. 847 yrs., g.r. 2*l.*, r. 80*l.*, 1,700*l.*; 59, 61, 67, and 69, Dunstan's-rd., Dulwich, u.t. 86 yrs., g.r. 10*l.* 10s., 690*l.*; 33, 35, and 37, Lettsom-rd., Camberwell, u.t. 377 yrs. no g.r., r. 91*l*, 860*l.*; 90, Portland-pl. North, Clapham u.t. 10 yrs, g.r. 4*l.*, r. 31*l.* 4s., 87*l.*; 72 to 78 even, Wilcox-rd., Lambeth, u.t. 63 yrs., g.r. 12*l.*, 1 080*l.*; l.g.r. of 30*l.*, Wandsworth-rd., u.t. 17 yrs., g.r. 10*l.*; and 39, Pascal-st., 160*l.*

FEBRUARY 26.—By *L. Farmer*: 122, Maida-vale, f., 1,425*l.*—By *Harman Bros.*: "The Lions," Mount Pleasant-lane, Clapton, u.t. 10 yrs., g.r. 9*l.* 10s., 190*l.*; 5 and 6, High-rd., u.t. 14 yrs., g.r. 20*l.*, r. 90*l.*, 305*l.*—By *Hards & Bradly*: 12 and 14, Eustace-rd., Fulham, u.t. 80 yrs., g.r. 10*l.*, r. 72*l.* 16s., 580*l.*; 1, Lacon-rd., Dulwich, u.t. 82 yrs, g.r. 7*l.*, r. 33*l.* 16s., 150*l.*; 2 and 4, Turner-rd., Lee, u.t. 38 yrs, g.r. 4*l.* 10s., r. 62*l* 490*l.*—By *R. Reid*: 8, Fouberts-pl., Regent-st., f., r. 70*l.*, 1,340*l.*; 82, Berwick-st., f., r. 75*l.*, 1,330*l.*; the lease of 14, Fouberts-pl., u.t. 6 yrs., 50*l.*—By *Field & Sons*: F.g.r. of 15*l.*, with reversion in 18 yrs., Peckham, 475*l.*; f.g.r. of 3*l.*, with reversion in 39 yrs., Clayton-rd., 120*l.*; 20 and 22, Rye-lane, f., 2,720*l.*; f.g.r. of 10*l.*, with reversion in 8 yrs., Tottenham-court-rd., 550*l.*; 79, Drury-lane, f., r. 30*l.*, 575*l.*; 41, Great Ormond-st., Bloomsbury, f., r. 50*l.*, 1,200*l.*; 10, Winslade rd., Brixton, u.t. 75 yrs., g.r. 7*l.* 10s., r. 36*l.*, 300*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	9/0.0	0/0/0
Teak, E.I... load	9/10/0	15/0/0
Sequoia, U.S. ft.cu.	2/3	3/0
Ash, Canada load	2/10/0	4/0/0
Birch, do.	3/5/0	4/10/0
Elm, do.	3/10/0	4/15/0
Fir, Dantsic, &c.	2/0/0	3/10/0
Oak, do.	3/0/0	5/0/0
Canada.....	5/0/0	7/0/0
Pine, Canada red	2/10/0	3/10/0
Do, yellow	2/10/0	5/0/0
Lath, D'ntsic, fath	5/5/0	6/10/0
St. Petersburg	5/10/0	7/10/0
Deals, Finland, 2nd & 1st std	9/10/0	10/10/0
Do, 4th & 3rd..	7/10/0	8/10/0
Do. Riga	6/10/0	8/0/0
St. Petersburg, 1st yellow ..	11/0/0	15/0/0
Do. 2nd yellow	8/10/0	10/10/0
Do. white	7/10/0	10/10/0
Swedish	7/15/0	16/0/0
White Sea	8/10/0	18/0/0
Canada, Pine 1st	20/0/0	26/0/0
Do. do. 2nd....	14/10/0	16/10/0
Do. do. 3rd, &c.	8 5/0	10/10/0
Do. Spruce. 1st	8/10.0	11/0/0
Do. do. 3rd & 2nd.....	6/15/0	8.0/0
New Brunswick	7/0/0	7/10/0
Battens, all kinds	3/10/0	15/10/0
Flooring Boards, sq., 1 in. prep. 1st	0 8/6	0/14/6
Do. 2nd.....	0/7/6	0/11/6
Other qualities	0/5/0	0/8/0
Cedar, Cuba ..ft.	/3½	/4½
Honduras, &c.	/2½	/4
Mahogany, Cuba.	/4½	/6½
St. Domingo, cargo av	/4½	2 0
Mexican do. do	/4	/5
Tobasco do. do	/5½	/7
Honduras do..	/5½	/6½
Box, Turkey ton	4/0/0	15/0/0
Rose, Rio.....	10/0/0	20/0/0
Bahia	9/0.0	18/0/0
Satin, St. Domingo ....ft.	0 0 8	0/1/3
TIMBER (*continued*).		
Satin, Porto Rico	0/0/8	0/1/6
Walnut, Italian..	0/0/3½	0/0/7
METALS.		
IRON—Pig, in Scotland .....ton	2/0/3	2/0/4
Bar, Welsh, in London.....	6/0.0	6/10.0
Do. do. at works in Wales	5/10.0	6/0 0
Do. Staffordshire, in London	6/5 0	6/15/0
COPPER—British, cake and ingot	46/0.0	47/0/0
Best selected ..	48 0/0	48 10/0
Sheets, strong..	57/0.0	58/0/0
Chili, bars	44/2 6	44/10/0
YELLOW METAL lb.	0 0/5½	0/0/5¾
LEAD—Pig, Spanish....ton	10 15 0	10/17.6
English, com. brands	11/0/0	11/2 6
Sheet, English, 3 lbs. per sq. ft. and upwards ..	13 0 0	0/0/0
Pipe	13/10 0	0/0/0
ZINC—English sheet .....ton	25/5 0	0/0/0
Vieille Montagne.....	25 15 0	0/0/0
TIN—Straits	89/7/6	89/10/0
Australian	84/10/0	84/15/0
English Ingots	92/10/0	92/15/0
OILS.		
Linseed .....ton	18 15 0	18 17.6
Cocoanut, Cochin	25 0/0	25/10/0
Do. Ceylon	22/15/0	0/0/0
Palm, Lagos	23/10 0	0/0/0
Rapeseed, English pale	26.0.0	26 5 0
Do. brown	24/5/0	24/10/0
Cottonseed ref...	18/5/0	0/0/0
Oleine	21/10/0	22 10/0
Lubricating, U.S.	4/10/0	5/10/0
Do. refined	5/0 0	10/0/0
TAR—Stockholm barrel	0/19/0	1/0/0
Archangel	0/12/6	0/0/0

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *noon on Thursdays.*]

ABERDARE.—For alterations and additions to the "Bush" inn, Aberdare, for the Ely Brewery Company, Limited. Mr. C. H. Elford, architect, 15, Cardiff-street, Aberdare:—

John Jones	£555	William Thomas	£330
Michael Thomas (mislaid).. ..		A. R. Thomas.....	305
John Morgan, Monk-street, Aberdare*	370		

* Accepted.

BRISTOL.—For new road and approaches to the Keynsham Union, near Bristol. Mr. John Mackay, architect and surveyor Kingswood, Bristol:—

Wm. Thomas	£299 15 7	A. Kendall	£225 0
R. R. Facey	282 14 0	W. Meryweather ...	216 0 0
Fred. Martin	278 12 0	J. Carpenter	186 0 0
Jas. Wiltshire.....	255 0 0	H. West, Bath*	155 10 0
A. Webb	241 14 9		

* Accepted.

CHISWICK.—For building a pair of villa residences in Chiswick for Mr. W. Boughton, Hammersmith. Mr. J. Hume, architect and surveyor, Chiswick. Quantities supplied:—

S. Hunt	£1,135	Adamson & Son	£1,093
Chamberlen Bros.	1,119	— Nye, Ealing (accepted)..	995

DAWLISH (Devon).—For the erection of six cottages, for Miss Empson. Mr. Chas. Cole, architect, 50, High-street, Exeter. Quantities by the architect:—

Tree & Bolley	£2,187 0 0	Cundy & Stoy'e	£1,953 8 8
F. Friend	2,095 0 0	J. H. Lamacraft	1,941 0 0
Ham & Pasmore	2,000 0 0	J. Wescott.....	1,909 6 4
Friend & Cundy, Dawlish*	1,976 3 10	C. Hawking	1,760 0 0
		H. Ferris	1,576 11

* Accepted.

HASTINGS.—For the construction of roads on the St. Helen's Park Estate, Hastings. Mr. F. H. Humphreys, surveyor, Hastings:—

	Estimate No. 1.	Estimate No. 2
W. J. Botte ill	£924 0 0	£998 0
A. Cohen	790 0 0	880 0
W. H. Wheeler	636 0 0	742 0
Barlow & Roberts.....	642 0 0	662 0
P. Jenkins	517 0 0	596 0
F. Gurssell	483 17 0	549 14
Piper & Son.....	458 7 2	493 12

HOUNSLOW.—For rebuilding shops, Nos. 161 and 163, High-street, Hounslow, for Mr. H. Perks. Messrs. J. H. & H. E. Jones, architects, 9, Moorgate-street E.C. Quantities by the architects:—

W. Hogbin	£2,534 5	W. H. Lascelles & Co...	£2,236 0
G. Daniels.....	2,300 0	T. Hiscock, Hounslow*.	2,224 0

* Accepted.

HULL.—For the erection of the proposed new Catholic schools on the Hes-le-road Boulevard, Hull. Messrs. Smith & Brodrick, and A. Lowther, joint architects:—

John Drury	£2,287 1	M. Harper	£2,087 2
Geo. Houlton	2,271 0	H. Vickers	2,030 8
Hockney & Liggins	2,125 0	G. Jackson & Sons	1,979 0
F. Blackburn.....	2,094 19	Colley & Levitt*	1,946 15

* Accepted.

LONDON.—For alterations to 227, Strand, W.C., for Mr. R. Baker. Messrs. Saville & Martin, architects, Dacre-house, Arundel-street, Strand W.C. Quantities supplied:—

H. B. Oldrey.....	£2,511	Gould & Brand.....	£2,325
S. Goodall..	2,349	E. Toms	2,248
C. Dearing & Son	2,343		

Fitter's Work.

Sage & Co.....	£332	Drew & Cadman.....	£223
S. Yardley & Sons	253		

LONDON.—For pulling-down and re-building the "Horse Shoe" public-house, Tottenham Court-road. Mr. J. M. Knight, architect:—

Mowlem & Co.	£12,651	W. Brass	£10,140
Stimpson & Son.....	11,164	Kirk	10,100
J. Bywaters.....	10,480	Ashby Bros.	9,975
W. Shurmur	10 449	Patman & Fotheringham.	9,853
Colls & Son	10,250	Allen & Son.....	9,665

LONDON.—For new addition, shop-front, fixtures, &c., at Nos. 442 and 444, Holloway-road, N., for Messrs. Isaac Walton & Co.:—

John Wynne, 62, Newington-causeway, S.E..... £2,360 0

[No competition.]

LONDON.—For alterations and additions to the "Burlington" Restaurant, Regent-street, W., for the London Catering Company. Messrs. Saville & Martin, architects, Dacre-house, Arundel-street, Strand, W.C. Quantities supplied by Messrs. Woodward & Argent, 6, Duke-street, Adelphi :—

Thos. Gregory & Co.	£2,962	Colls & Sons	£2,795
F. L. Green	2,922	Higgs & Hill	2,770
Ashby Bros.	2,890	G. H. & A. Bywaters*	2,719

Pewterer's Work.

S. Heath	£153	Sanders & Sons	£109
W. Helling	130	J. Edwards*	105

* Accepted.

LONDON.—For alterations and additions to the "Royal Oak" public house, St. John's-road, Holloway, N., for Messrs. G. Soole & Son. Messrs. Saville & Martin, architects, Dacre House, Arundel-street, Strand, W.C. Quantities supplied :—

E. Toms	£2,862	W. Scrivener & Co.	£2,795
S. Goodall	2,848	Dearing & Son	2,718
Ward & Lamble	2,822	Gould & Brand (accepted)	2,697

Pewterer's work.

S. Heath	£203 0	J. C. Edwards	£161 5
W. Helling	185 10	Sanders & Sons (accepted)	159 0

Gasfitter's work.

Vaughan & Brown	£187 0	E. Morris	£169 9
J. Biggs	178 0	E. Pragnell (accepted)	144 0

LONDON.—For pulling down the "Flying Horse" public-house, Oxford-street, W., and premises adjoining in Bozier's-court, for Messrs. H. & R. Baker. Messrs. Saville & Martin, architects, Dacre House, Arundel-street, Strand, W.C. :—

Kirk & Randall	£845	J. Allan & Sons	£195
Ashby Bros.	406	Colls & Sons	192
G. H. & A. Bywaters	243	T. L. Green (accepted)	187

LONDON.—For alterations to the London and South-Western Bank, West Norwood Branch. Messrs. Tolley & Sons, architects, 66, Cannon-street :—

Bristow	£1,947	Pullen & Co.	£1,698
Mitchell	1,943	Marriage	1,697
Smith & Sons	1,826	Lyon & Sons	1,671
Bowyer	1,769	Carmichael	1,575

LONDON.—For erecting warehouse, Tottenham-road, Kingsland. Mr. J. Hamilton, architect :—

S. Hayworth	£1,676	G. Beale	£1,567
Gould & Brand	1,647	W. Shurmur	1,395
B. E. Nightingale	1,600	S. Goodall	1,390

LONDON.—For the erection of a new public-house, to be known as the "White Hart" Hotel, Gipsy-lane, Upton Park, E., for Mr. J. Davies. Mr. Fred. A. Ashton, architect, 3, Crooked-lane, E.C. :—

Cousell Bros	£3,443	W. Watson	£3,217
Hearle & Farrow	3,398	W. Shurmur*	3,195
E. Voller	3,369		

* Accepted.

LONDON.—For erecting new warehouse at 86, Kingsland-road. Mr. T. N. Laslett, architect :—

		Time for completion.
Holloway Bros.	£3,800 0 0	10 weeks.
Martin Wells	3 400 0 0	18 ,,
T. Boyce	3,300 0 0	12 ,,
Higgs & Hill	3,280 0 0	— ,,
Staines & Son	3,150 0 0	14 ,,
E. Garner	3,075 0 0	13 ,,
Paramor	3,000 0 0	16 ,,
W. Dabbs	2,990 0 0	15 ,,
B. Cromwell	2,972 0 0	20 ,,
King & Co.	2,950 0 0	14 ,,
W. Shurmur	2,889 0 0	12 ,,
J. Morter	2,870 0 0	16 ,,
Jarvis & Son	2,800 0 0	16 ,,
Adlard	2,685 0 0	8 ,,

LONDON.—For painting and repairs at the Fire Brigade Station, Islington, for the London County Council. Mr. Thomas Blashill, Architect :—

Davis Bros.	£335 0	A. D. Smith & Sons	£196 0
J. R. Powditch & Co.	227 0	W. Wills	173 10
J. Knight	207 0	G. S. S. Williams & Son*	154 0

* Accepted conditionally.

MERTHYR TYDFIL.—For building a block of buildings, Market-square, Merthyr Tydfil, South Wales, for Mr. T. J. Masters, Cardiff. Mr. S. C. Wakeling, architect, Merthyr Tydfil :—

Burton & Co.	£11,875	Cowlin & Sons	£9,920
Hy. Welsh	11,000	T. Jones	9,700
S. Watkins & Co.	10,863	D. C. Jones & Co.	9,582
T. Rees	10,175	Stephens, Bastow, & Co.	8,999
S. D. Williams	10,145	Bowers & Co.,* Hereford	8,100

* Accepted.

NEWPORT (Mon.).—For rebuilding 168, Commercial-street, for Mr. W. Allen. Messrs. William Graham, Son, & Hitchcox, architects :—

Morgan & Roberts	£2,099 0	George Wilkins	£2,010 0
John Linton	2,045 10	William Blackburn*	1,997 0

* Accepted.

SHEFFIELD.—For the construction and erection of police-station, constables'-dwellings, &c., at Millhouses, Sheffield. Plans, specifications, and quantities prepared by Mr. C. F. Wike, C.E., Borough Surveyor :—

Jas. Richerby	£3,709 14 6	Walker & Slater, Derby*	£2,130 0 0
G. J. Helliwell	2,966 9 6	J. H. Hurst†	1,901 19 3
J. Fish & Son	2,740 12 0		
R. Hunt	2,733 19 11½		

* Accepted. † Withdrawn.

SUNDERLAND.—For the erection of a new infirmary, Stockton-road, for the Committee of the Sunderland and North Durham Eye Infirmary. Mr. J. W. Donald, A.R.I.B.A., architect, Russell-chambers, King-street, South Shields. Quantities by the architects :—

R. Goodwin & Son	£4,989 10 0	Walter Scott & Son	£4,621 0 0
W. B. Cooper	4,853 0 0	Joseph Howe	4,611 0 0
T. P. Shaftoe	4,853 0 0	D. & J. Ranken, Sunderland*	4,465 0 0
W. J. Robertson	4,786 18 3	M. Howarth	4,397 18 0
H. Brown & Co.	4,718 18 4		
J. Huntley	4,655 0 0		

* Accepted.

WARRINGTON.—For alterations to baths and construction of new swimming-bath, for the Town Council. Mr. Thos. Longdin, Borough Surveyor, Warrington :—

W. Gibson & Son, Warrington £3,716 0 0

WATERFORD.—For new Training College, for the Brothers of the Christian School's, Newtown, Waterford, Ireland. Mr. Wm. H. Byrne, architect, 20, Suffolk-street, Dublin :—

Collin Bros.	£20,810	G. Nolan, Waterford*	£20,700
T. Hearne	20,564	M. Hunt	17,647

* Accepted subject to modifications.

New Premises, Charles-street and Stephen-street, Lisson-grove.—Regarding the lists of tenders for these works published in our last (p. 172), the architect, Mr. F. W. Hunt, asks us to say that they are inaccurate, but he declines to tell us in what respect. Whatever errors there are, they are not ours.

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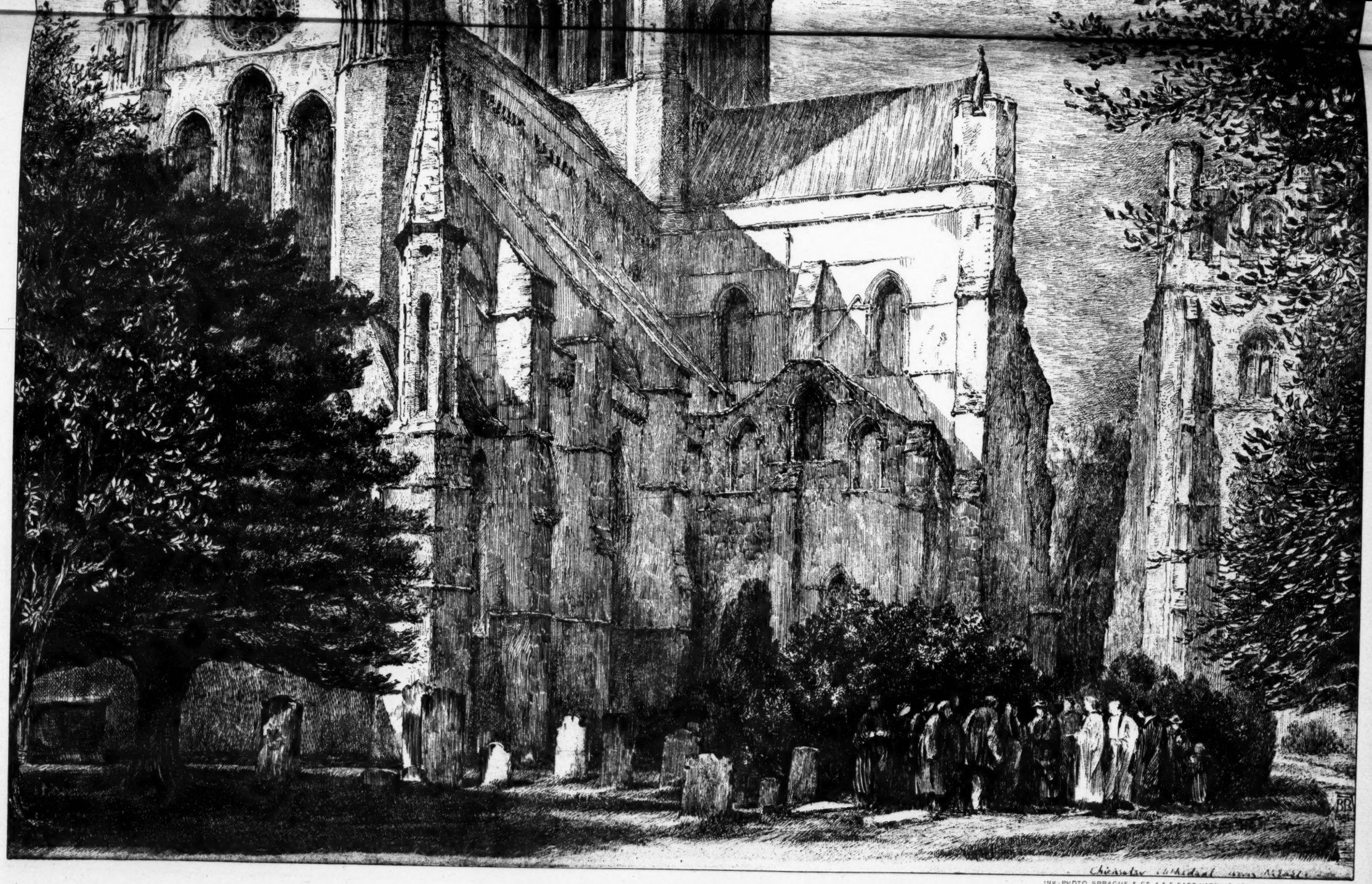

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Cathedrals of England and Wales.

No. 15. CHICHESTER.—Drawn by Mr. Beresford Pite, A.R.I.B.A.

THE CATHEDRAL CHURCH OF THE HOLY
CHICHESTER 1892

Scale of

Campanile

NORTH PORCH

ST. ANNE

ST. EDMUND?
or the Four Virgins

ST. THOMAS

NORTH WEST TOWER

13

12

LECTERN

GALILEE

HOOK MEMORIAL
PLATT

14

SOUTH WEST TOWER

PLATT

ST. GEORGE

ST. CLEMENT

SOUTH PORCH

SACRISTY

THE PALACE

F-TH…LY-TRINITY-

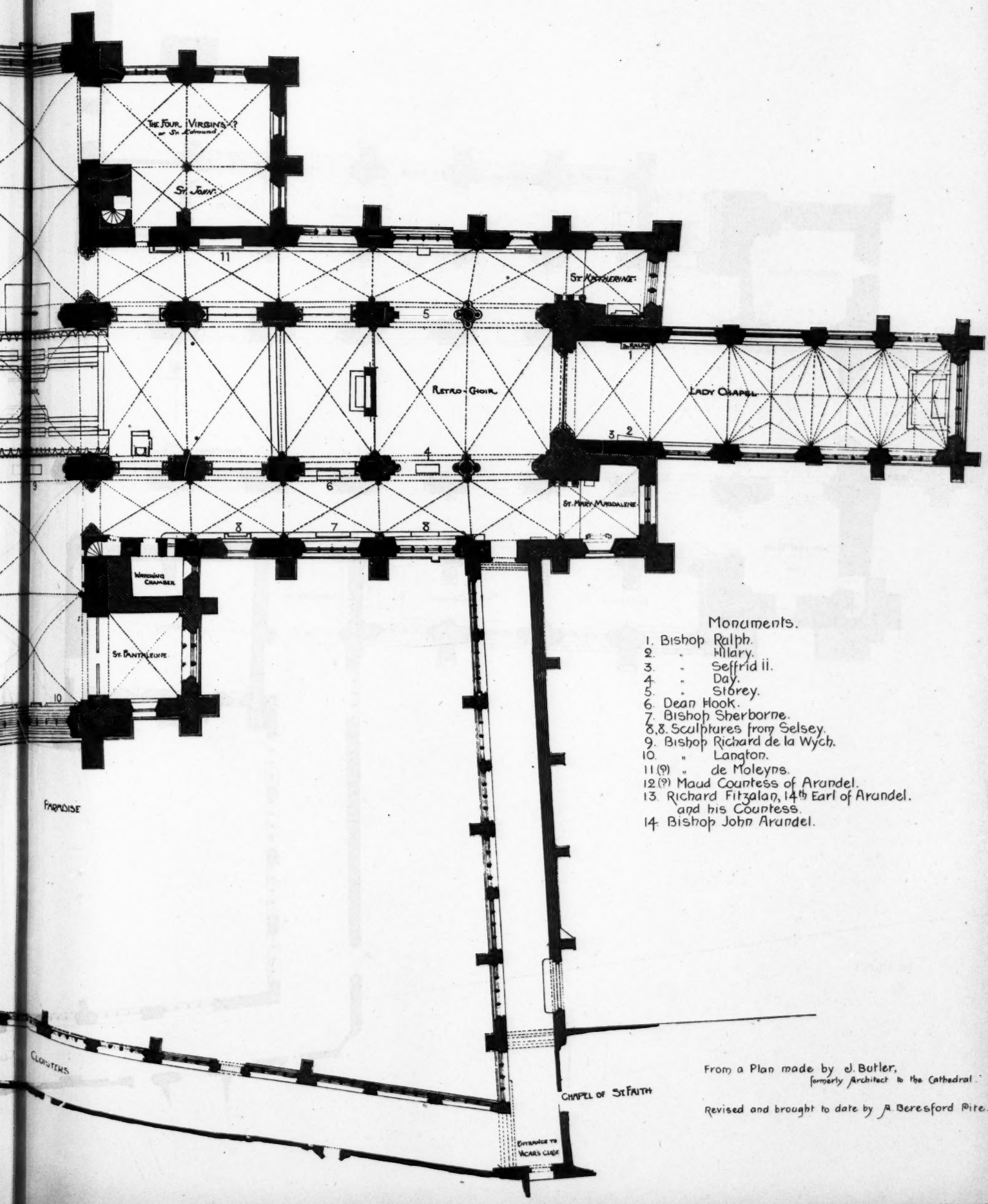
Chronological Key to Plan.

1st Period. Norman.

2nd Period. 1186-1199.

3rd Period. 1199-1288.

4th Period. 1288-et seq.



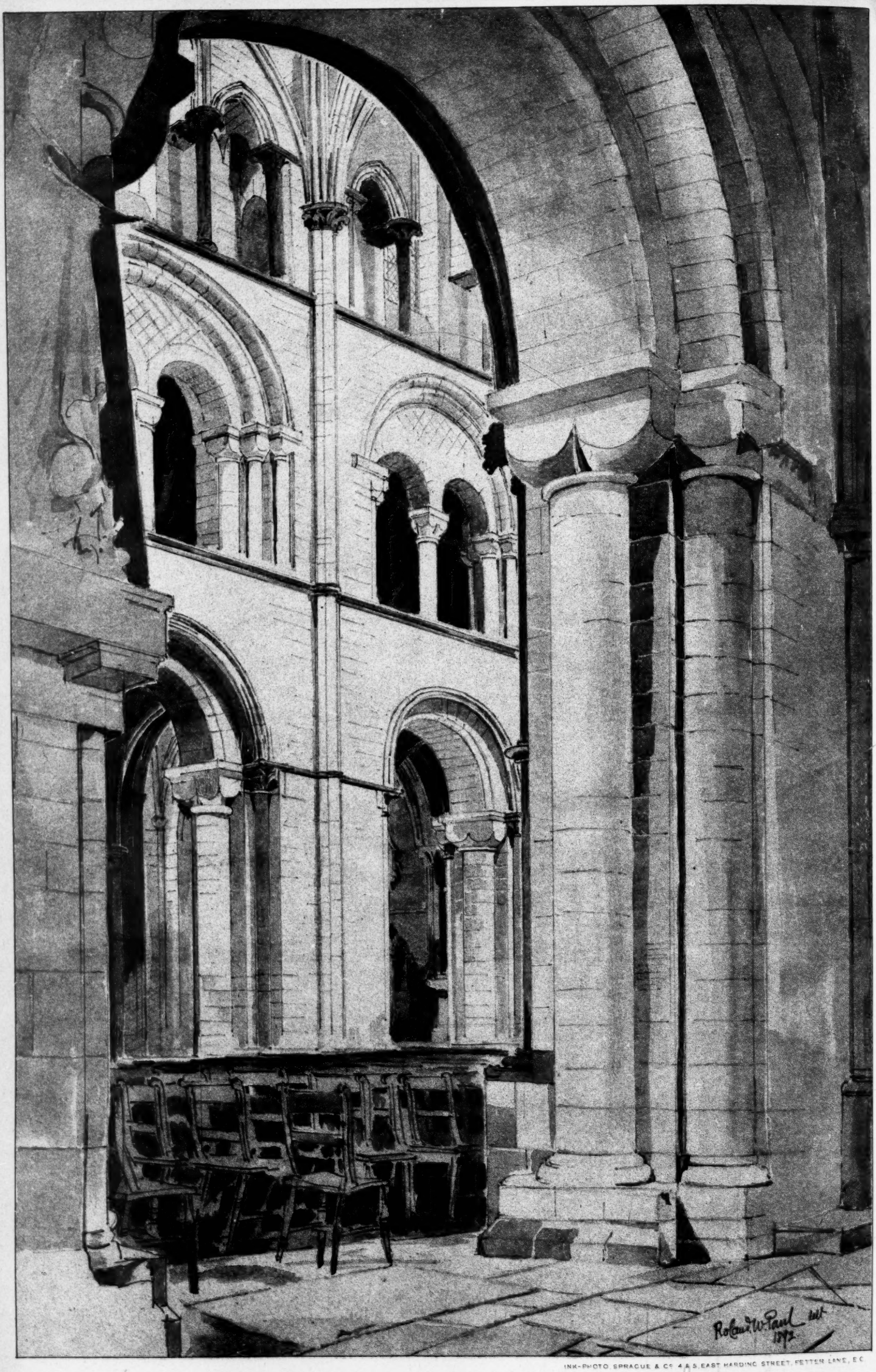
Monuments.

1. Bishop Ralph.
2. " Hilary.
3. " Seffrid ii.
4. " Day.
5. " Storey.
6. Dean Hook.
7. Bishop Sherborne.
8,8. Sculptures from Selsey.
9. Bishop Richard de la Wych.
10. " Langton.
11 (?) " de Moleyns.
12 (?) Maud Countess of Arundel.
13. Richard Fitzalan, 14th Earl of Arundel. and his Countess.
14. Bishop John Arundel.

From a Plan made by J. Butler, formerly Architect to the Cathedral.

Revised and brought to date by A. Beresford Pite.

PHOTO-LITHO. SPRAGUE & Co 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.



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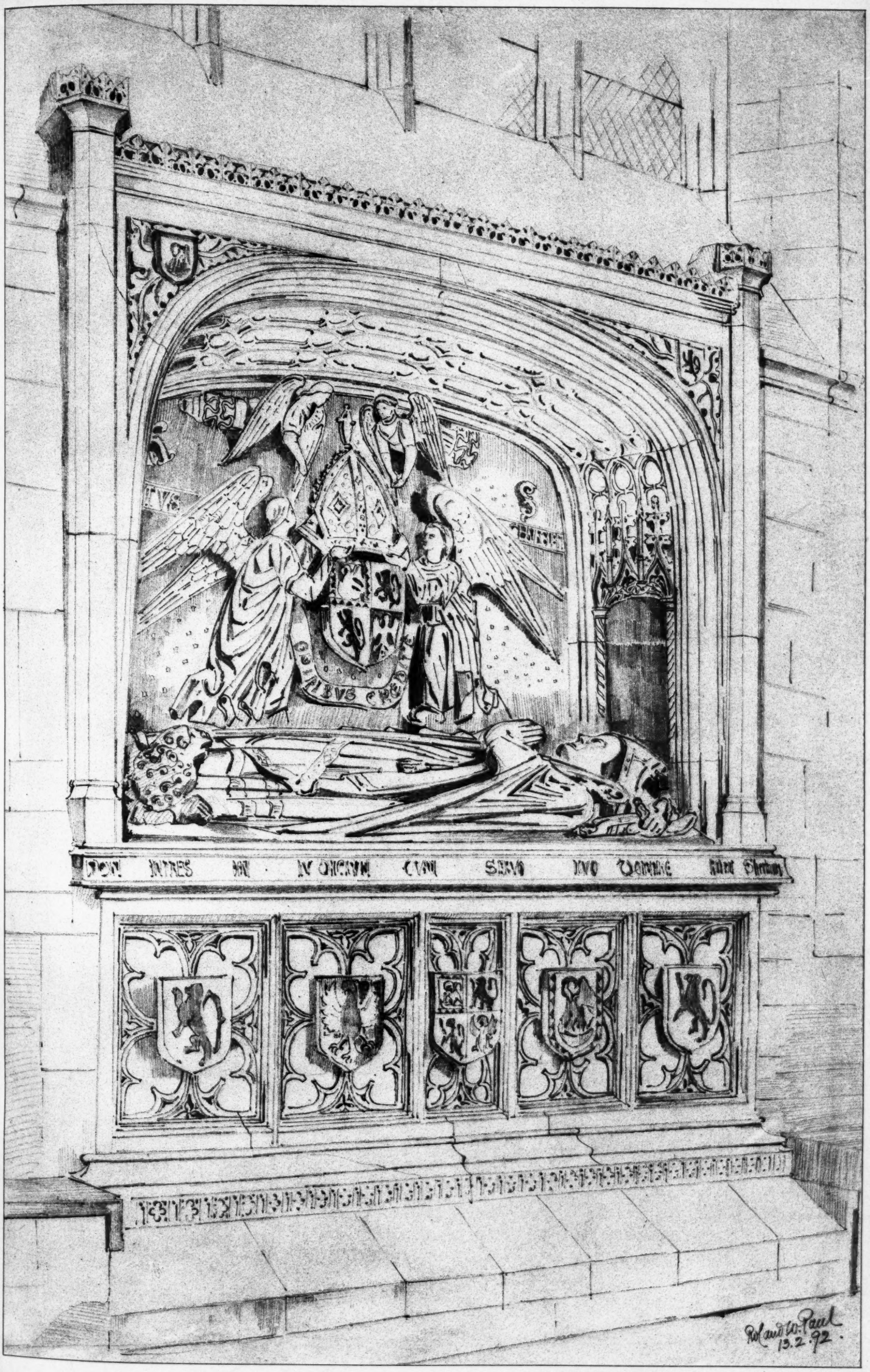
CHICHESTER CATHEDRAL: VIEW ACROSS NAVE.



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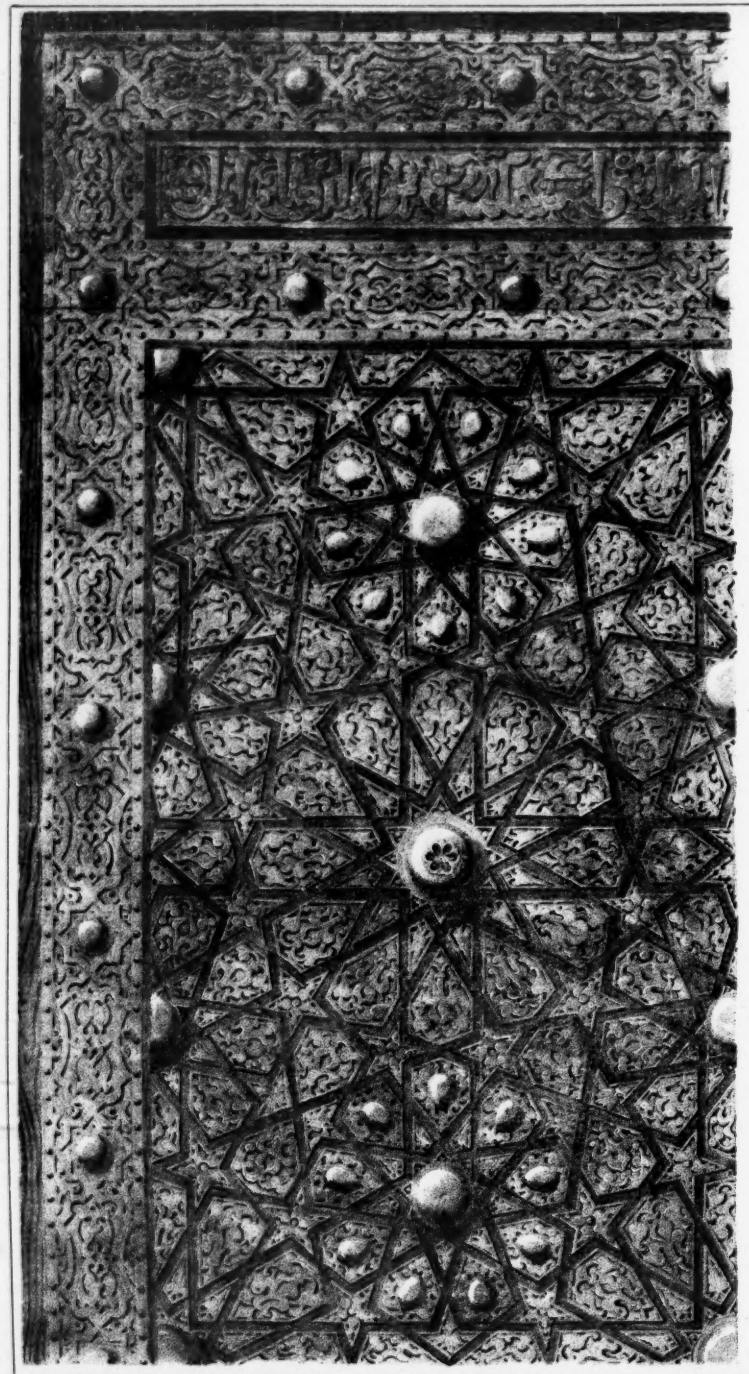
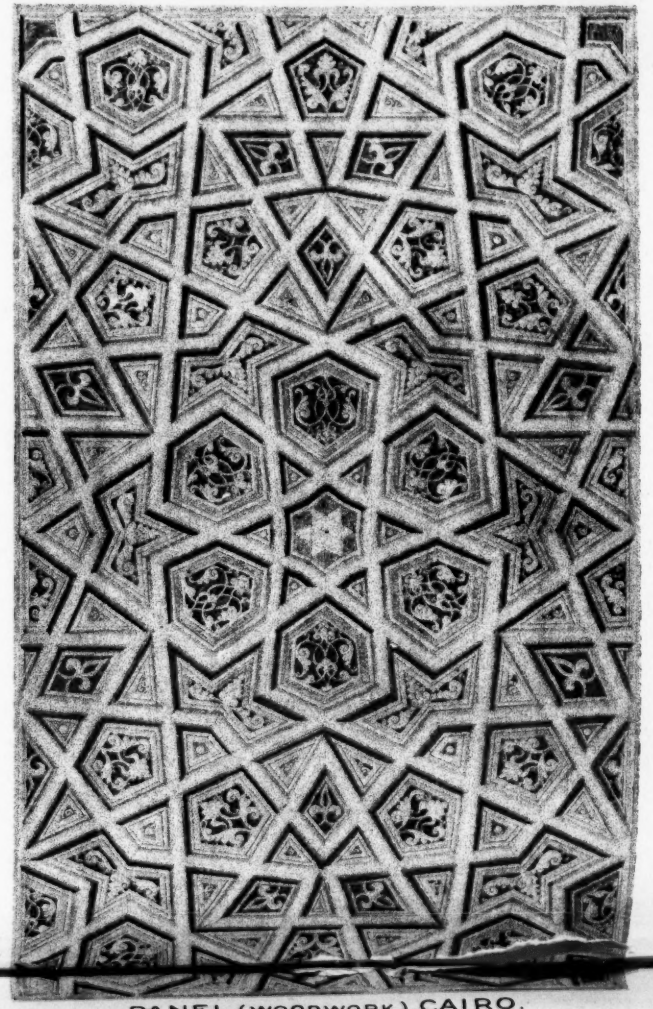
CHICHESTER CATHEDRAL: BISHOP SHERBORNE'S TOMB.



¼ DOOR OF MOSQUE SULTAN DAAHIR BIBARS. CAIRO.

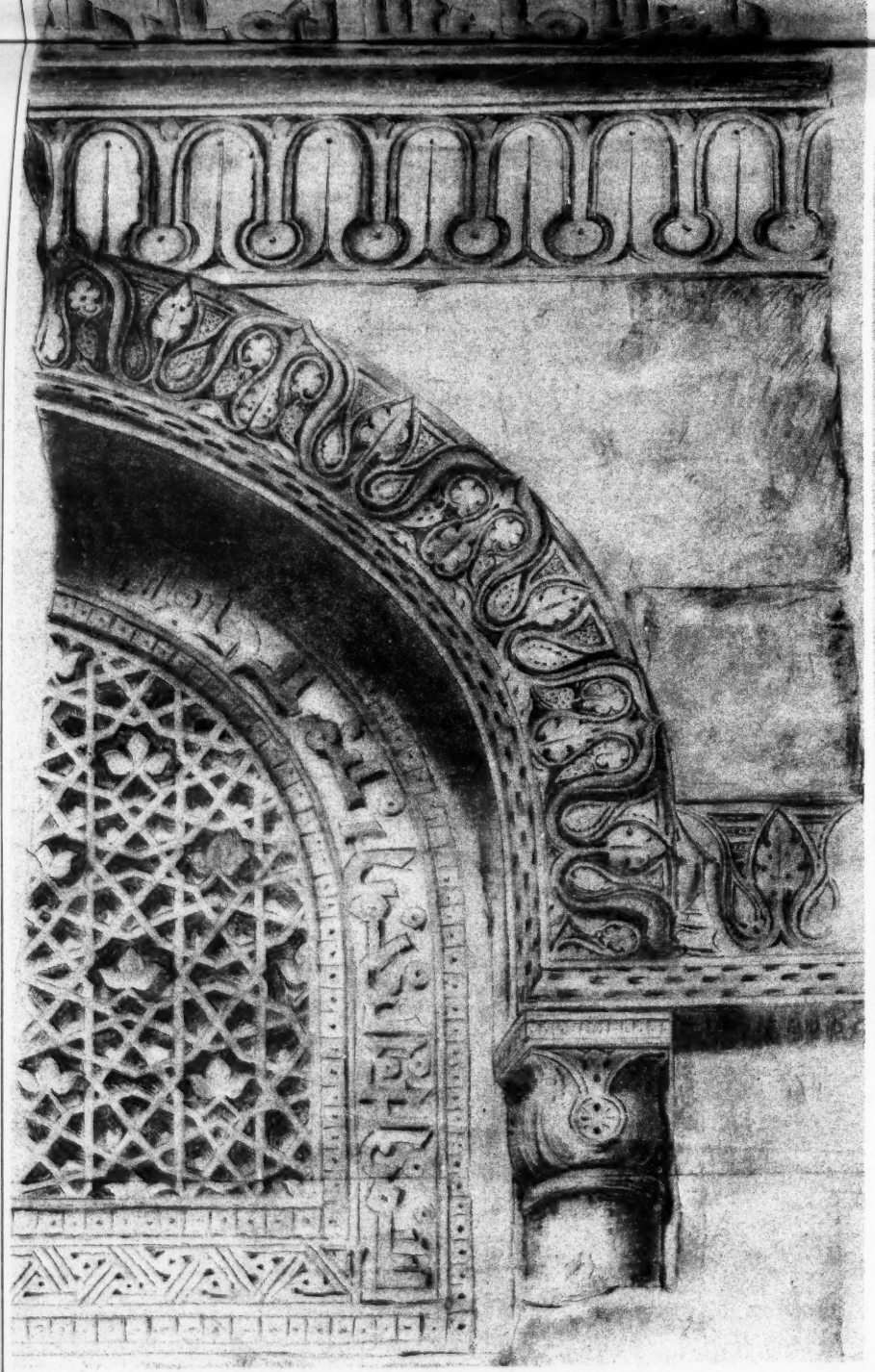
PAINTED TILES.

MOSQUE OF TOULOUN, CAIRO.
(DETAIL OF PLASTER CARVING.)

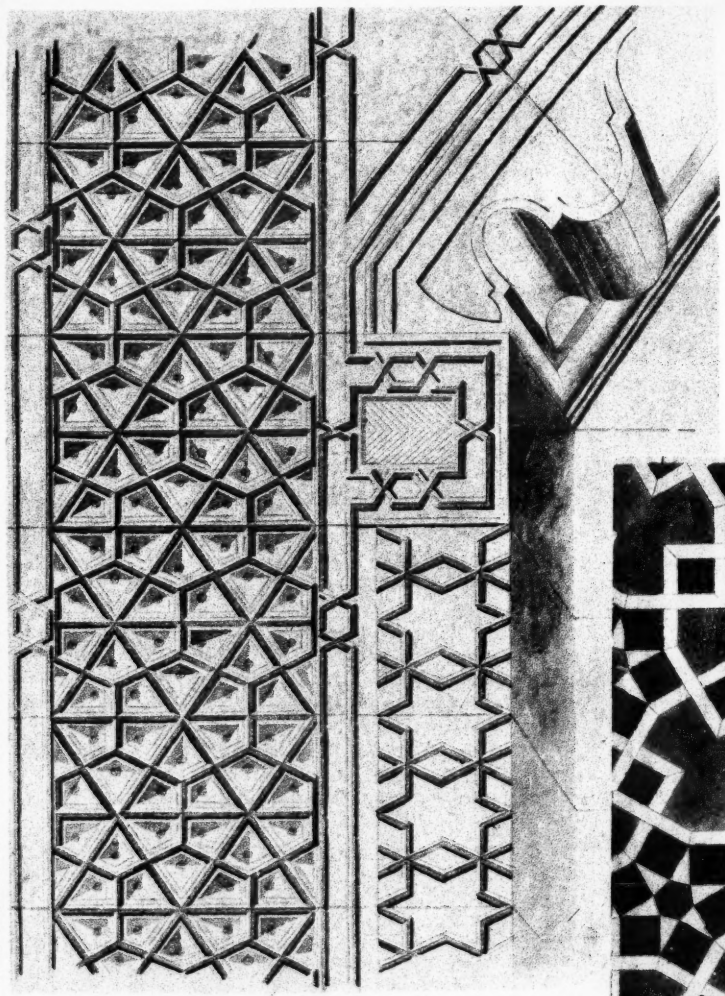


PANEL (WOODWORK) CAIRO.

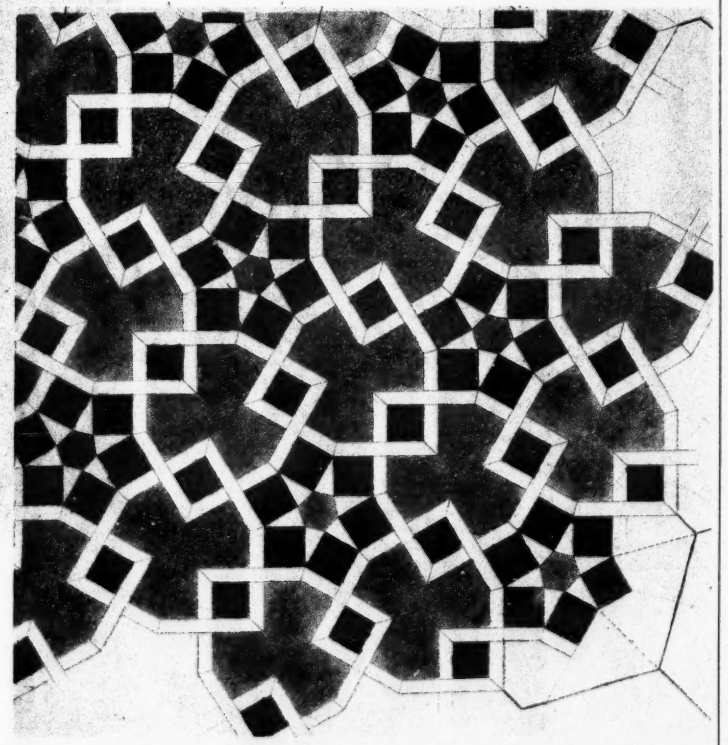
PANEL (WOODWORK) CAIRO.



MOSQUE OF TOULOUN.



DETAIL OF STONE CARVING. CAIRO
(DOOR JAMB)



MARBLE PAVEMENT FROM ALEXANDRIA.

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DETAILS OF SARACENIC ORNAMENT.

(In illustration of Professor Aitchison's Royal Academy lectures.)